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CONTRIBUTIONS FROM THE GRAY HERBARIUM OF  
HARVARD UNIVERSITY.

NEW SERIES. — No. XIX.

BY M. L. FERNALD.

- I. A Synopsis of the Mexican and Central American Species of *Salvia*.
- II. A Revision of the Mexican and Central American Solanums of the Subsection *Torvaria*.
- III. Some undescribed Mexican Phanerogams, chiefly *Labiatae* and *Solanaceae*.

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CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD  
UNIVERSITY, NEW SERIES, NO. XIX.

By M. L. FERNALD.

Presented by B. L. Robinson, March 14, 1900. Received April 19, 1900.

I.—A SYNOPSIS OF THE MEXICAN AND CENTRAL  
AMERICAN SPECIES OF *SALVIA*.

In his monograph of the *Labiatae* in De Candolle's *Prodromus*, Bentham (1848) recognized 118 species of *Salvia* in Mexico and Central America, several of them, however, being known only from the original descriptions.

In the botanical portion of *Biologia Centrali-Americana*, Mr. Hemsley enumerated 135 species, but a number of them were unknown to him, seven have proved to be identical with others there listed, and the records of two are based upon their occurrence in adjacent portions of the United States but not in Mexico proper. Thus excluding these nine species, there were recorded by Mr. Hemsley, in 1887, 126 Mexican and Central American *Salvias*.

During the past quarter century the unprecedented activity in the botanical exploration of those countries has brought together in *Salvia*, as in many other large genera, an abundance of material for study. Many of these recent collections have been critically examined, and a large number of species based upon them have been described. The collections of the past decade, furthermore, contain very many unique plants which cannot be referred to any of the species already published. These species, together with those described in the last half-century, since the publication of Bentham's treatment of the group in the *Prodromus*, increase the number of known Mexican and Central American *Salvias* by nearly one hundred.

In order to place before students of Mexican botany many previously undescribed forms and to show more clearly than could otherwise be done their affinities, a synopsis has been prepared of all the known Mexican and Central American species. In the preparation of this work the general divisions of Bentham have been adopted, though with

more material at hand it has been necessary in many cases to amplify or alter the limits of groups as defined by him.

It was hoped that the treatment of the genus published by M. le Professeur Jean Briquet in "Engler & Prantl's Natürlichen Pflanzenfamilien"<sup>1</sup> would be of assistance in preparing this synopsis; but, except for the introduction of somewhat helpful minor divisions of the groups, that work adds little to the earlier conclusions of Bentham. In fact, so far at least as the Mexican species are concerned, Professor Briquet's translations of Bentham's sectional and subsectional diagnoses are most unfortunate, often so far so as quite to contradict the true characters of the plants he is supposed to be describing, and entirely to mislead the student who attempts to follow his synopsis. In the description of the very first group, the § *Micranthae*, for example, Bentham says: "Corolla vix 3-linearis calyce dimidio vel rarius subduplo longior" (corolla about 3 lines long, once and a half or rarely almost twice as long as the calyx), proportions which are maintained almost without exception by the species of that section. Yet this is rendered by Briquet "Blkr. [Blumenkrone] klein, die Hälfte der Länge des Kelches erreichend, seltener 2 mal grösser" (corolla small, half the length of the calyx, rarely twice longer) although the species which constitute the section have the corolla as defined by Bentham. Briquet's description of the § *Microsphaceae*, included by Bentham in the Prodrömus under § *Micranthae*, reads: "Blkr. klein, kaum die Hälfte der Länge des Kelches erreichend" (corolla small, scarcely half as long as the calyx), thus suggesting plants with the calyx definitely exceeding the corolla, instead of the species, enumerated by him, with the corolla distinctly exceeding the calyx. Again in the § *Brachyanthae* Bentham describes the lower lip of the corolla as follows: "labium patens . . . galea longius" (lip spreading . . . longer than the galea), while Briquet, rendering it into German says ". . . ausgebreiteter Unterlippe, diese nicht länger als die Oberlippe" (. . . the spreading lower lip, this not longer than the upper lip [galea]), thus absolutely contradicting the character of the corolla as shown by the species included by him in the section.

Of the 217 *Salvias* recognized in the present paper, specimens — or in seven cases merely authentic plates — of 174 species have been examined. Of the remaining 43 species very many, although well described, were unknown to Bentham and have not been identified with recently collected material. Others recognized by Bentham as of doubt-

<sup>1</sup> Engler & Prantl, Nat. Pflanzenf. iv. Ab. 3, 270-286.



ful status are here noted, although they are so incompletely characterized as to make their identification without access to the types quite impossible. In such cases the traditional conception of the plant has been maintained as far as possible, though it is highly probable that future study of these little-known types will identify some of them with better known species.

The descriptions of two species recently published from old manuscripts contain so little of specific significance that it is impossible to say upon what plants they were based. These are *S. azurea* and *S. dichroma*, La Llave in La Naturaleza, vii (1885) Apend. 82.

A European species, *S. Sclarea*, L., is often cultivated in central Mexico and is sometimes distributed in exsiccatae as if an indigenous plant (for example, see Schaffner's no. 49 from the mountains of San Luis Potosi).

In the study of species of § *Membranaceae* Mr. N. E. Brown of the Royal Gardens at Kew has rendered very valuable service by comparing specimens submitted to him with the types of Bentham's species.

#### SYNOPSIS OF SPECIES.

(As far as possible the sectional numbers and descriptions have been maintained as given in the Prodrromus.)

Section VII. CALOSPHACE, Benth. Calyx ovate, tubulose or campanulate, the upper lip entire or shortly tridentate, the teeth approximate, and the middle one longest. Corolla-tube exserted or included, not annulate within, but occasionally furnished with 2 teeth near the base. Upper lip (galea) straight or concave, entire or often short-emarginate; the lower with spreading lobes. Anterior portion of the connective deflexed, linear, longitudinally connate or approximate, occasionally a little dilated, and rarely bearing an empty adnate anther-cell.

976 § 1. MICRANTHAE, Benth. Bracts small, mostly deciduous. Corolla blue or white, short, 8 mm. or less (in one species nearly 1 cm.) in length, very slightly or rarely almost twice exceeding the calyx; the tube generally ventricose; the galea straight.

\* Corolla very small, 3 to 5 mm. long: calyx glandular.

+ Calyx-lobes blunt.

1. *S. OCCIDENTALIS*, Swartz, Fl. Ind. Occ. i. 43; Benth. l. c. 296; Gray, Syn. Fl. ii. pt. 1, 370; Hemsl. l. c. 562; Briq. l. c. 277. *S. procumbens*, Ruiz & Pav. Fl. Per. & Chil. i. 27, t. 39, fig. a. *S. radicans*, Poir. Dict. vi. 621. *Verbena minima chamaedryos folio*, Sloane, Jam. i.

172, t. 107. *Hyptis glandulosa*, Sieb. Fl. Mart. Exs. no. 151, fide Benth. l. c. — Common in tropical and subtropical America, extending north to Vera Cruz. VERA CRUZ, Mt. Orizaba (*Botteri*, no. 394); Cordoba (*Asa Gray*): YUCATAN, waste ground near Merida, April, 1887 (*Porfirio Valdez*, no. 55): GUATEMALA, Coban, Dept. Alta Verapaz, alt. 1,320 m., Nov. 1886 (*H. von Tuerckheim* in exsicc. J. D. Smith, no. 1090); Santa Rosa, alt. 770 to 920 m., May, Dec., 1892 (*Heyde & Lux* in exsicc. J. D. Smith, nos. 3014, 4399): HONDURAS, San Pedro Sula, Dept. Santa Barbara, alt. 250 m., May, 1888 (*C. Thieme* in exsicc. J. D. Smith, no. 5422): NICARAGUA (*Charles Wright*): COSTA RICA, Ujaras (*Oersted*); Cartago, alt. 1,300 m., Dec., 1887 (*Juan J. Cooper*) in exsicc. J. D. Smith, no. 5901; roadsides San José, Jan., 1893 (*Ad. Tonduz*, no. 7280).

— + — Calyx-lobes subulate-mucronate.

— + Bracts deciduous.

2. *S. MISELLA*, HBK. l. c. 290; Benth. l. c. 297; Hemsl. l. c. 561; Briq. l. c. — Described from near Acapulco: perhaps the same as the next.

— + — Bracts persistent.

3. *S. OBSCURA*, Benth. Lab. 245, & in DC. l. c. 297; Millspaugh, Field Columb. Mus. Bot. ser. i. 43. *S. privoides*, Gray, Syn. Fl. l. c. 371, not Benth. *S. occidentalis*, Millsp. l. c., in part, not Swartz. *S. occidentalis*, var.? *Garberi*, Chapm. Bot. Gaz. iii. 10. — Range similar to that of *S. occidentalis*, extending north to Sinaloa and Lower California. LOWER CALIFORNIA, La Paz, 1890 (*Edw. Palmer*, no. 10): SINALOA, Mazatlan, Dec., 1894 (*F. H. Lamb*, nos. 311, 317): GUERRERO, Acapulco, 1895 (*Edw. Palmer*, no. 244): VERA CRUZ, Valley of Cordova, Dec. 18, 1865 (*Bourgeau*, no. 1504): YUCATAN, roadside, near Izamal, Jan. 14, 1895 (*Millspaugh*, no. 90); Island of Cozumel, 1895 (*G. F. Gaumer*, no. 394).

\* \* \* Corolla 6 to 8 mm. long.

— + Calyx glandular.

— + Bracts caducous.

= Stem villous: leaves ovate-lanceolate, rufous-tomentose beneath: verticels 4-6-flowered: calyx with obtuse lobes.

4. *S. INCONSPICUA*, Benth. Lab. 247, & in DC. l. c. 298; Hemsl. l. c. 558; Briq. l. c. 278. — Described from Mexico. Not seen.

= = Stem pubescent with long spreading gland-tipped hairs: leaves broad-ovate, slightly puberulent beneath: verticels 2-flowered: calyx with acuminate lobes.

5. *S. PODADENA*, Briq. Ann. Conserv. Jard. Bot. Genève, ii. 131. — Described from OAXACA. Not seen.

→ → Bracts persistent.

= Leaves villous or long-pilose beneath.

a. Leaves canescent on both faces, 1 to 3 cm. long, on slender naked petioles: calyx-lobes acutish.

6. *S. SEROTINA*, L. Mant. 25; Jacq. Ic. Rar. i. 1, t. 3; Benth. l. c.; Hemsl. l. c. iv. 107; Briq. in Engl. & Prantl, l. c. *S. dominica*, Vahl. Enum. i. 233; Swartz, Obs. 18, t. 1. fig. 1, not L. — Florida and the West Indies. Reported from Cozumel Island, YUCATAN.

b. Leaves ferrugineous-villous beneath, 1 dm. or less long, cuneate to winged petioles: calyx-lobes setaceous-mucronate.

7. *S. PRIVOIDES*, Benth. Bot. Sulph. 150, & in DC. l. c. 297; Hemsl. l. c. ii. 563; Briq. l. c. — Southern Mexico and Central America. JALISCO, Guadalajara, Sept., 1886 (*Edw. Palmer*, no. 498); cool shady places, barranca near Guadalajara, Nov. 5, 1888 (*C. G. Pringle*, no. 1727); San Sebastian, alt. 1,185 to 1,540 m., March 16, 1897 (*E. W. Nelson*, no. 4072); MORELOS, Cuernavaca, Nov. 14, 1865 (*Bourgeau*, no. 1239); OAXACA, Jayacatlan, alt. 1,320 m., Sept. 10, 1894 (*L. C. Smith*, no. 174).

= = Leaves short-pilose or glabrate beneath.

a. Inflorescence an oblong raceme, 4 to 7 cm. long, not secund: calyx tubulose-campanulate, in fruit 7 mm. long.

8. *S. MICRANTHA*, Vahl. Enum. i. 235; Benth. l. c. 298; Hemsl. l. c. 561; Briq. l. c. *S. bullata*, Ort. Dec. ix. 109; Jacq. Hort. Schoenb. iv. 41, t. 481. *S. serotina*, Vahl. l. c. 232, not L. *S. occidentalis*, Millsp. l. c. in part, not Swartz. — Tropical America, in Mexico known only from the Yucatan coast. YUCATAN, streets of Dolores, Island of Mugeris, Jan. 1, 1895 (*Millsbaugh*, no. 18); without locality, 1896 (*Porfirio Valdez*, no. 31). *S. orbicularis*, Benth. Bot. Sulph. 151, from Panama seems to differ from the species only in its fruticose base.

b. Inflorescence secund, loosely-flowered.

1. Calyx-tube bearing long straight spreading setiform glandless hairs mixed with the shorter gland-tipped ones; upper lip entire: racemes simple, elongated, becoming 1 to 1.5 dm. long.

9. *S. setosa*. Annual, 2 to 5 dm. high; the stems slightly appressed-retorse-setulose on the angles: leaves ovate or rhombic-ovate, thin, acute or blunt at tip, cuneate at base to winged petioles, crenate-serrate, 8 cm. or less in length, sparingly appressed-setulose above, paler and minutely puberulent or glabrate beneath: racemes stiff; verticels mostly 2-flowered, all becoming remote, the lowest 1.5 to 2.5 cm. apart: bracts

lance-subulate, 5 to 7 mm. long: pedicels 2 to 4 mm. long: calyx in anthesis 5 mm., in fruit 9 mm. long; the lobes equalling the tube, narrow-ovate, with long subulate aristiform tips, the pubescence less spreading than on the tube: corolla 7 to 8 mm. long; the sparingly pilose lips deep blue. — *S. privoides*, Gray in Wats. Proc. Am. Acad. xxi. 435; Rose, Contrib. U. S. Nat. Herb. i. 110; not Benth. — North-western Mexico. CHIHUAHUA, Hacienda San José, 1885 (*Edw. Palmer*, no. 64): SONORA, by shaded water-courses and in cañons, Alamos, Sept., 1890 (*Edw. Palmer*, no. 680, 681).

2. Calyx pubescent with gland-tipped hairs; upper lip generally tridentate: racemes paniculate, 5 cm. or less in length.

10. *S. lateriflora*. Bushy-branched annual, 2.5 to 3 dm. high: stems sparingly retrorse-pilose: leaves ovate or rhombic-ovate, thin, blunt or acutish at tip, cuneate to slender petioles 5 cm. or less long, coarsely crenate-dentate, minutely setulose on both faces or glabrate: flowers solitary or in 2's, all remote, the lowest 0.7 to 1 cm. apart: bracts ovate, acuminate, 1 to 2 mm. long: pedicels 2 to 4 mm. long: calyx in anthesis 2 to 3 mm., in fruit 5 to 6 mm. long; the tube twice exceeding the broad blunt subulate-tipped lobes. — SONORA, about abandoned gardens, Guaymas, Oct., 1887 (*Edw. Palmer*, no. 320). Habitally resembling *Seutellaria lateriflora*. A fragmentary specimen collected by *Xantus* at Cape St. Lucas, LOWER CALIFORNIA, may belong here.

— — Calyx not glandular.

— Leaves thin, membranaceous, the primary ones 4 to 9 cm. long: verticels 6-many-flowered.

11. *S. TILIAEFOLIA*, Vahl. Leaves broad- or rhombic-ovate, cordate truncate or rounded-cuneate at base, sparingly pubescent on both faces, dark green above. — Symb. iii. 7; Jacq. Hort. Schoenb. iii. 2. t. 254; Benth. l. c. 299; Hemsl. l. c. 566. *S. fimbriata*, HBK. l. c. 299, t. 149. — Common in tropical America, extending northward through Mexico. CHIHUAHUA, Valley of Chihuahua, Sept. 17, 1885 (*C. G. Pringle*, no. 556; damp places, Cañon de Pilares, Sept. 22, 1891 (*C. V. Hartman*, no. 749): COAHUILA, Saltillo, 1848-49 (*J. Gregg*, no. 542); Soldad, Sept., 1880 and in shaded places, Saltillo, Sept., 1880, 1898 (*Edw. Palmer*, nos. 1062, 335): DURANGO, abundant in shade near Durango, Sept., 1896 (*Edw. Palmer*, no. 572): SAN LUIS POTOSI, in deep shade near the city, 1876 (*Schaffner*, no. 674), alt. 1,850 to 2,460 m., 1878 (*Parry & Palmer*, nos. 743, 746½): AGUAS CALIENTES (*Hartweg*, no. 159): MEXICO, Valley of Mexico, May 5, 1865 (*Bourgeau*, no.

122) : VERA CRUZ, Orizaba (*Botteri*, nos. 533, 869), Aug. 13, 1891 (*Seaton*, no. 304); Cordoba (*Asa Gray*) : OAXACA, Monte Alban, alt. 1,900 m., Oct. 11, 1895 (*L. C. Smith*, no. 949) : GUATEMALA, Santiago, Dept. Zacatepéquez, alt. 2,000 m., 1891 (*Rosalía Gomez* in exsicc. J. D. Smith, no. 816); Castillas, Dept. Santa Rosa, alt. 1,230 m., Sept., 1892 (*Heyde & Luz* in exsicc. J. D. Smith, no. 4055) : COSTA RICA, Cartago, alt. 1,300 m., Nov., 1888 (*Juan J. Cooper* in exsicc. J. D. Smith, no. 5900); San José, July, 1892, and San Francisco de Guadalupe, Dec., 1893 (*Ad. Tonduz*, nos. 701, 8456). See note under *S. Chia. S. flexuosa*, Presl in Benth. Lab. 248, is perhaps only a glabrate form of this species, apparently represented by *Botteri's* no. 395 from Orizaba.

Var. *cinerascens*. Whole plant cinereous with fine puberulence. — JALISCO, barranca near Guadalajara, Oct. 3, 1891 (*C. G. Pringle*, no. 5176).

↔ ↔ Leaves firm, small, 1 to 2.5 cm. long: verticels 2-4-flowered.

= Herbaceous, erect: leaves broad-ovate, cordate, minutely pubescent: lower verticels in axils of upper foliar leaves.

12. *S. HUMILIS*, Benth. Lab. 247, & in DC. l. c. 298; Hemsl. l. c. 558; Briq. l. c. — Described from "Mexico." Not seen.

= = Diffusely branching from woody base: leaves narrowly rhombic-ovate, or oblong-ovate, cuneate, densely pilose-setulose beneath: racemes short-peduncled.

13. *S. pusilla*. Stems 1 to 2.5 dm. long, slender and wiry, puberulent and hoary with fine spreading setulose hairs; more or less diffusely branched: leaves blunt or acutish, irregularly more or less serrate, green above, pale beneath, long-setulose on both faces or glabrate above, on short slender petioles: peduncles 1.5 to 4 cm. long: racemes 1 to 8 cm. long; the verticels all remote, the lowest becoming 2 to 2.5 cm. apart: bracts ovate, 3 to 4 mm. long, firm and essentially persistent: pedicels very short: calyx white-setulose, in anthesis 2 to 3 mm., in fruit 5 mm. long; the tube once and a half longer than the acuminate lobes: corolla blue, 7 mm. long; the tube short-exserted; the pilose galea twice exceeded by the lip: style densely bearded. — OAXACA, vicinity of Yalalag, alt. 1,230 to 2,400 m., July, 1894 (*E. W. Nelson*, no. 958); Sierra de San Felipe, alt. 2,160 m., Sept. 23, 1895 (*C. Conzatti*, in exsicc. L. C. Smith, no. 708).

\* \* \* Corolla 9 to 10 mm. long.

← Leaves cuneate or rounded-cuneate at base: calyx subglabrous.

↔ Leaves oblong-lanceolate.

14. *S. OUROPHYLLA*, Briq. Ann. Conserv. Jard. Bot. Genève, ii. 126. — Described from COSTA RICA. Not seen.



↔ ↔ Leaves ovate or ovate-elliptic.

15. *S. PERMIXTA*, Briq. l. c. 129. — Described from COSTA RICA. Not seen.

+ + Leaves hastate at base: calyx glandular.

16. *S. COSTARICENSIS*, Oersted in Kjoeb. Vidensk. Meddel. (1853) 39; Hemsl. l. c. 555. — COSTA RICA, Cartago, alt. 1,300 m., Dec., 1887 (*Juan J. Cooper* in exsicc. J. D. Smith, no. 5895); San José, Oct., 1892 (*Ad. Tonduz*, no. 7158).

499 § 2. MEMBRANACEAE, Benth. Flowers as in the *Micranthae* or a little larger. Bracts suborbiculate, persistent, membranaceous, veiny, equalling or exceeding the calyx.

\* Leaves narrow-ovate, cuneate or narrowed at base.

+ Calyx glabrous, subtruncate, with very short teeth: verticels approximate, forming a spiciform raceme 4 to 8 cm. long: bracts and calyces blue or roseate.

17. *S. LOPHANTHA*, Benth. in DC. l. c. 301; Hemsl. l. c. 560, in part; Briq. in Engl. & Prantl, l. c. — GUATEMALA, Santa Rosa, alt. 1,230 m., Oct., 1892 (*Heyde & Lux* in exsicc. J. D. Smith, no. 4051).

+ + Calyx pubescent.

↔ Calyx canescently short-pilose, not viscid: verticels remote, forming a raceme 1 to 2.5 dm. long.

18. *S. MOCINOI*, Benth. Lab. 271, & in DC. l. c. 300; Hemsl. l. c. 561; Briq. l. c. — GUATEMALA, Laguna de Ayarza, Dept. Jalapa, alt. 2,460 m., Sept., 1892 (*Heyde & Lux* in exsicc. J. D. Smith, no. 4048).

↔ ↔ Calyx viscid, short-pilose.

= Branches pilose; the hairs spreading.

a. Racemes simple, or very slightly branched; verticels tending to become remote; the primary racemes becoming 0.8 to 2 dm. long: lowest bracts crenate-serrate.

19. *S. RUBIGINOSA*, Benth. l. c. 301. Mature leaves pubescent beneath only on the nerves. — Hemsl. l. c. 565; Briq. l. c. *S. lophantha*, Donnell Smith, Enum. Pl. Guat. ii. 62, not Benth. *S. Mocinoi*, Donnell Smith, l. c. iv. 125, 188, in part, not Benth. — Southern Mexico and Central America. GUATEMALA, Pinula, alt. 1,350 m., Feb., 1890 (*J. D. Smith*, no. 1911); Chiapas, Dept. Santa Rosa, alt. 1,080 m., Dec., 1892 (*Heyde & Lux* in exsicc. J. D. Smith, no. 4400).

Var. *hebephylla*. Leaves velutinous beneath. — *S. lophantha*, Hemsl. l. c. 560, in part, not Benth. — VERA CRUZ, region of Orizaba, Oct. 11, 1866 (*Bourgeau*, no. 3215): CHIAPAS, among the mountains (*Ghiesbreght*, no. 745): GUATEMALA, Volcan Fuego, Zacatépéquez, alt. 1,540 m., March, 1892 (*J. D. Smith*, no. 2597).

b. Inflorescences paniculate; all the verticels remote: bracts entire.

20. *S. cladodes*. Stems glabrate below, sordid-pilose above: leaves oblong to narrow-ovate, 1 dm. or less long, 5 cm. or less wide, long-acuminate at tip, cuneate at base, finely crenate-serrate, short-velutinous or glabrate on both surfaces; petioles 2 cm. or less long: panicle with slender ascending densely pilose branches 1 to 2 dm. long: bracts purplish, broad-ovate or suborbicular, acuminate, more or less pilose, ciliate: verticels 1 to 2.5 cm. apart, 3-9-flowered; pedicels 4 to 7 mm. long, spreading and nodding at tips: calyx purplish, in anthesis 8 to 9 mm. long, broadened upward; the tube glandular-pilose; the glabrate limb with ovate-acuminate lobes: corolla-tube included; the lips one half longer than the calyx. — Northwestern Mexico. Without locality (*See-mann*): TEPIC, near Compostela, alt. 1,540 to 1,850 m., Apr. 7-8, 1897 (*E. W. Nelson*, no. 4171).

= = Branches canescent with appressed strongly recurved hairs: only the lowest verticels remote, the spiciform racemes 1 to 6 cm. long: bracts entire or undulate, ciliate.

21. *S. saltuensis*. Stems 1 to 1.5 m. high, bearing solitary terminal racemes or many inflorescences of 1 to 3 verticels on short leafy branchlets: leaves 6 cm. or less long, acute, finely crenate-serrate, dull green and finely pubescent above, canescent-tomentulose beneath, on slender petioles 1.5 cm. or less in length: bracts reniform, acuminate, brownish or slightly rosy tinged, minutely pubescent on the nerves, 1 to 1.5 cm. long: calyx purple-tinged, appressed-hirsute, in anthesis 7 mm. long, with broad blunt or short-acuminate lobes: corolla 1.3 cm. long, blue, the pilose galea one half as long as the lip. — MORELOS, in woods of Sierra de Tepoxtlán, alt. 2,310 m., Feb. 8, 1899 (*C. G. Pringle*, no. 8035): JALISCO, between San Sebastian and the summit of Mt. Bufa de Mascota, alt. 1,380 to 2,300 m., March 20, 1897 (*E. W. Nelson*, no. 4103).

= = = Of close affinity to the preceding is

22. *S. BUPLEUROIDES*, Presl in Benth. Lab. 271, a glabrous plant with fascicled peduncles each bearing solitary many-flowered verticels. Not identified.

\* \* Leaves broad-ovate (narrow-ovate in *S. nitida*) or rhombic-ovate, rounded to the subcordate truncate or subcuneate base.

+ Verticels remote (approximate in a form of *S. hyptoides*): leaves 5 cm. or less in length.

↔ Leaves glabrous or only minutely puberulent.

= Leaves ovate-lanceolate, glossy.



23. *S. NITIDA*, Benth. in DC. l. c. 300; Hemsl. l. c. 562; Briq. l. c. *Hyptis nitida*, Mart. & Gal. Bull. Acad. Brux. xi. pt. 2, 189. — Described from OAXACA. Not seen.

= = Leaves rhombic-ovate, dull.

24. *S. galinsogifolia*. Stems 1.5 to 6 dm. high, branching, minutely puberulent, the young parts canescent: leaves 5 cm. or less in length, blunt or acutish, minutely and sparingly puberulent or glabrous, the lowest shorter than the slender petioles: peduncles 1.5 dm. or less in length; verticels from 1 to 5, the lowest becoming 3 to 5 cm. apart; rhachis canescent: bracts reniform, short acuminate, pale-brown or roseate-tinged, puberulent, ciliate-margined: calyx white-villous, with bluntish ovate-lanceolate lobes: corolla 8 to 9 mm. long, puberulent; the galea thrice exceeded by the lip. — *S. hyptoides*, Gray in Wats. Proc. Am. Acad. xxi. 435; Rose, Contrib. U. S. Nat. Herb. i. 110; not Mart. and Gal. — Northwestern Mexico. CHIHUAHUA, Hacienda San Miguel, 1885 (*Edw. Palmer*, no. 205): SONORA, in shade, mountain-cañon, Alamos, Sept., 1890 (*Edw. Palmer*, no. 682); Huehuerachi, alt. 1,230 m., Dec., 1890 (*C. V. Hartman*, no. 323, *F. E. Lloyd*, no. 452). Resembling *S. hyptoides*.

↔ ↔ Leaves setulose-hirsute.

= Calyx white-lanate, with short deltoid lobes.

25. *S. LASIOCEPHALA*, Hook. & Arn. Bot. Beech. 306; Benth. l. c.; Hemsl. l. c. 559; Briq. l. c. — TEPEC, Tepic (the type station), Feb., 1895 (*F. H. Lamb*, no. 621).

= = Calyx-tube hirsute; lobes lanceolate.

26. *S. HYPTOIDES*, Mart. & Gal. l. c. 74; Benth. l. c.; Hemsl. l. c. 558; Briq. l. c. *S. elsholtzioides*, Benth. Bot. Sulph. 152, t. 50. — Southern Mexico to Venezuela. JALISCO, bluffs of the Rio Grande de Santiago, near Guadalajara, Oct. 19, 1889 (*C. G. Pringle*, no. 2297): VERA CRUZ, Jalapa, alt. 1,230 to 1,390 m., 1894 (*C. L. Smith*, no. 1664): OAXACA, dry banks, Sierra de San Felipe, alt. 2,160 m., Oct. 11, 1894 (*C. G. Pringle*, no. 5624); Jayacatlan, alt. 1,320 m., Nov. 4, 1894 (*L. C. Smith*, no. 269); El Fortin, alt. 520 m., 1897 (*C. Conzatti & V. González*, no. 478): GUATEMALA, Coban, Dept. Alta Verapaz, alt. 1,320 m., March, 1886 (*H. von Tuerckheim* in exsicc. J. D. Smith, no. 299); Jumaytepeque, Dept. Santa Rosa, alt. 1,850 m., Sept., 1892 (*Heyde & Luz*, in exsicc. J. D. Smith, no. 4047): COSTA RICA, Volcan el Viejo (*Oersted*).

Var. *subspicata*. Plant simple, 1 to 2 dm. high: verticels 2 to 5,

approximate in a spiciform raceme 1 to 3.5 cm. long, or the lowest a little remote. — COSTA RICA, near San Francisco de Guadalupe, Jan. 4, 1893 (*Ad. Tonduz*, no. 7228).

+ + Verticels approximate in a spiciform raceme: principal leaves 6 to 8 cm. long.

27. *S. lophanthoides*. Stem tall, 1 m. or so high, glabrous, or minutely pilose at the tip; internodes 1 to 2 dm. long: leaves broad-ovate, short-acuminate, glabrous above, villous beneath on the nerves, and especially along the midrib, finely crenate-serrate, on slender petioles 3 cm. or less in length: peduncles 1.5 cm. or less long; racemes dense, the primary ones 1.3 dm. or less in length, 1.5 cm. thick: bracts brownish, ciliate-margined: calyx viscid, pilose on the strong nerves, in anthesis 5 to 6 mm. long, slightly enlarged at the throat, with broad-deltoid subulate-tipped lobes: corolla blue, slightly viscid, 1.2 to 1.4 cm. long, the lip twice exceeding the galea. — OAXACA, mountains near Tlapancingo, alt. 1,850 to 2,460 m., Dec. 7, 1894 (*E. W. Nelson*, no. 2086).

29 § 3. BRACHYANTHAE, Benth. Bracts small, after anthesis falling away, rarely persisting. Corolla middle-sized, conspicuously exceeding the calyx, 1 to barely 2 cm. long (rarely longer), generally blue, very rarely white flesh colored or crimson, never scarlet, with the tube generally ventricose and often contracted at the throat; with straight or scarcely arched galea (upper lip), and broader 3-lobed lower lip generally exceeding the galea, the middle lobe broadest and emarginate. (Species with exceptionally large flowers, but with their affinities here are *S. heterotricha*, *S. flaccida*, *S. cedrosensis*, *S. semitrata*, and *S. sidaefolia* with corollas fully 2 cm. long; *S. angustifolia* with corolla 2.5 cm. long; and *S. sessilifolia* with corolla 3 cm. long.)

30 A. *Angustifoliae*, Benth. Leafy-stemmed herbs or half-shrubs with slightly branching stems: leaves linear, lanceolate, or narrowly ovate-elliptic, narrowed cuneate or rounded-truncate at base.

\* Bracts orbicular, acuminate, about equalling the calyx, persistent: verticels becoming remote: calyx campanulate, green, strongly nerved, subinflated, becoming 1 cm. long, the broad upper lip suberect. Erect annual 2 to 4 dm. high.

28. *S. HIRSUTA*, Jacq. Hort. Schoenb. iii. 1, t. 252; Benth. in DC. Prodr. xii. 301; Hemsl. l. c. 557; Briq. in Engl. & Prantl, l. c. 278. *S. phlomidoides*, Cav. Ic. iv. 10, t. 320. *S. ciliata*, Poir. Dict. vi. 588. *S. bracteata*, Poir. l. c. 622. *S. sideritidis*, Vahl, Enum. i. 250. *S. cryptanthos*, Schultes, Obs. 12, acc. to Benth. *S. nepetifolia*, Poir. Suppl. v. 48. *S. ciliaris*, Sessé & Moc. Pl. Nueva España, ed. 2, 7. —

Central Mexico. DURANGO, infrequent on shady slopes of ravines, Santiago Papasquiaro, Aug., 1896 (*Edw. Palmer*, no. 451): SAN LUIS POTOSI, alt. 1,850 to 2,460 m., 1878 (*Parry & Palmer*, no. 736): MEXICO, barranca near Santa Fé, July 6, 1865-66 (*Bourgeau*, no. 490); Santa Fé, Sept. 3, 1899 (*C. G. Pringle*, no. 7991).

\* \* Bracts less conspicuous, soon deciduous: calyx campanulate, conspicuously bilabiate, subinflated.

← Leaves sessile or subsessile or narrowed to short inconspicuous petioles: racemes elongated, at least the lower verticels becoming remote: perennials. (*S. assurgens* may be looked for here.)

↔ Stems leafy nearly or quite to the inflorescence.

= Without glandular hairs on stem and calyx.

29. *S. ANGUSTIFOLIA*, Cav. Stems hispid, bearded at the nodes, 2 to 7 dm. high, very leafy: leaves mostly hispid on the margins and nerves — *l.c.* iv. 9, t. 317; *Lindley*, Bot. Reg. xviii. t. 1554; *Sweet*, Brit. Fl. Gard. n. s. iii. t. 219; *Benth.* l. c. 301; *Hemsl.* l. c. 552; *Gray*, Syn. Fl. N. A. ii. 369; *Briq.* l. c. *S. reptans*, Jacq. Hort. Schoen. iii. 38, t. 319. *S. virgata*, Ort. Dec. i. 3. — Central and Southern Mexico. ZACATECAS, near Plateado, Sept. 2, 1897 (*J. N. Rose*, no. 2745): JALISCO, Valley of Mexico, Tizapan, June 26, 1865-66 (*Bourgeau*, no. 125, in part): MICHOACAN, Tlalpujahua 1828 (*Graham*); plains near Patzcuaro, Aug. 7, 1892 (*C. G. Pringle*, no. 4163). *S. linifolia*, Mart. & Gal. l. c. 70, and *Benth.* l. c. 302, from MICHOACAN is probably only a form with rose-colored corolla.

Var. GLABRA, Gray, l. c. Stems and leaves glabrous. — *S. leptophylla*, *Benth.* Lab. 249, & in DC. l. c. 299. *S. azurea*, Torr. Bot. Mex. Bound. 131, in part. — From Texas through central and southern Mexico, of broader range than the hispid type. SAN LUIS POTOSI, in sand near the city of San Luis Potosi, 1876 (*Schaffner*, no. 672): AGUAS CALIENTES (*Hartweg*, no. 163); JALISCO, edge of swamp, Guadalajara, July, 1886 (*Edw. Palmer*, no. 226): CHIAPAS, without locality, 1864-70 (*Ghiesbreght*, no. 751); valley of Jiquipilas, alt. 650-1,100 m., Aug. 16, 1895 (*E. W. Nelson*, no. 2922).

= = Glandular-hairy.

30. *S. heterotricha*. Stems erect from a rather woody base, 2.5 to 4.5 dm. high, puberulent, and, especially above, bearing slender jointed glandular hairs: leaves linear-attenuate, strongly 1-3-nerved, 3 to 8 cm. long, puberulent or glabrate or rarely with some slender glandular hairs: raceme 2 cm. or less in length; verticels all remote, the lower 3 to 4 cm. apart, 3-9-flowered: bracts lanceolate to ovate-lanceolate, glandular-

ciliate, mostly shorter than the calyx: pedicels 2 to 4 mm. long: calyx tubular-campanulate, in anthesis 8 to 10 mm. long, glandular-ciliate on the strong nerves; lobes about 3 mm. long; the upper lip broadly ovate, bluntish, entire; lower lip with 2 slightly narrower and more pointed lobes: corolla blue or violet as in *S. angustifolia*, but the galea more pubescent: style bearded. — *S. angustifolia*, Gray in Wats. Proc. Am. Acad. xx. 445, in part, not Cav. — JALISCO, in bottoms, Rio Blanco, June, 1866 (*Edw. Palmer*, no. 53); plains near Guadalajara, July 1, 1889 (*C. G. Pringle*, no. 2913).

Var. *multinervia*. Leaves lance-linear to oblanceolate, mostly with 5 parallel nerves. — TEPIC, foothills between Acaponeta and Pedro Paulo, Aug. 2, 1897 (*J. N. Rose*, no. 1934).

↔ ↔ Raceme long-pedunculate: leaves confined to the lower half of the plant.

= Upper lobe of the calyx tridentate.

a. Calyx-tube pilose-hispid, not glandular: attenuate bracts glabrous or glabrate.

31. *S. COMOSA*, Peyr. Stem 2 to 6 dm. high, glabrous or glandular-pilose: leaves membranaceous, linear or lanceolate, the upper half crenate-serrate, generally pubescent beneath on the veins. — Linnaea, xxx. 32; Hemsl. l. c. 555. *S. glechomaefolia*, Wats. Proc. Am. Acad. xviii. 137, in part, not HBK. — Central and southeastern Mexico. Without locality (*Coulter*, no. 1115): SAN LUIS POTOSI, without locality, 1878 (*Parry & Palmer*, no. 761): MEXICO, Santa Fé, July 6, 1865–66 (*Bourgeau*, n. 396): VERA CRUZ, Mt. Orizaba, alt. 2,460 to 2,770 m., Aug., 1891 (*Seaton*, nos. 259, 323). Originally described from Toluca, MEXICO.

Var. *hypoglaucia*. Similar, glabrous: leaves slightly petioled, very glabrous, glaucous beneath, entire or serrulate at tip. — *S. hypoglaucia*, Briq. Ann. Conserv. Jard. Bot. Genève, ii. 136. — MICHOACAN, mountains about Patzcuaro, July 30, 1892 (*C. G. Pringle*, no. 4155). A glabrous and glaucous extreme, not separable otherwise from *S. comosa*.

b. Calyx and attenuate bracts glandular-hispid.

1. Leaves linear, revolute, with one conspicuous broad nerve.

32. *S. UNICOSTATA*. Slender, 2 to 4 dm. high: stem sparingly glandular-hispid: leaves 3 to 6 cm. long, 2 mm. or less wide, glabrous: peduncles 0.5 to 1 dm. long; raceme 1 to 1.5 dm. long, the lower verticels 0.5 dm. apart, the upper approximate; verticels 3–6-flowered: bracts short, ovate, subulate-tipped: calyx in anthesis 5 mm. long, the tube equalling the lance-subulate lobes: corolla 1.3 cm. long, puberulent. —

*S. angustifolia*, var. *glabra*, Wats. Proc. Am. Acad. xviii. 138, in part, not Gray. — SAN LUIS POTOSI, without locality, alt. 1,840 to 2,460 m., 1878 (*Parry & Palmer*, no. 760).

2. Leaves oblanceolate, pinnately nerved.

33. *S. firma*. Stems decumbent at base, glabrous below, glandular-pubescent in the inflorescence, 4 to 5 dm. high: leaves 4 to 8 cm. long, 0.5 to 2 cm. broad, acute or blunt at tip, cuneate at base, crenulate-serrate, thick and firm, glabrous, above subglabrous: peduncles elongated, 1-2-bracteate; racemes becoming 3 dm. long; verticels all distinct, 3-6-flowered, the lowermost 5 to 8 cm. apart: bracts short, broad-ovate, subulate-tipped: pedicels short: calyx campanulate, in anthesis 5 to 6 mm., becoming 1 cm. long; tube twice exceeding the lobes; upper lip broad-ovate, the teeth subulate; lobes of the lower lip with long subulate tips: corolla 1.5 cm. long, the tube slightly exerted, the dark blue lower lip with a pale spot in its centre and twice exceeding the puberulent blunt galea: style bearded. — *S. glechomaefolia*, Wats. l. c. not HBK. — JALISCO, on hillsides, Rio Blanco, June, 1886 (*Edw. Palmer*, no. 61).

= = Upper lip of calyx entire.

a. Glabrous: leaves oblong-lanceolate: bracts round, obtuse or short-mucronate.

34. *S. laevis*, Benth. Lab. 251, & in DC. l. c. 303; Hemsl. l. c. 559; Briq. l. c. & in Engl. & Prantl, l. c. — Not seen. Described from Mexico and from near Talpajahua, MICHOACAN.

b. Pubescent: leaves elliptic-ob lanceolate or narrowly obovate: bracts ovate, long-attenuate.

35. *S. sinaloensis*. Stems slender, 2 to 2.5 dm. high, slightly branched, below short-hirsute, above and in the inflorescence densely pubescent with long straight fine viscid hairs: leaves acutish, the upper half appressed-serrate, the lower half subentire, subcuneate to a sessile base or obscurely short-petioled; those of the main stem 3 to 4 pairs, the uppermost largest, 3.5 to 6 cm. long, 1.25 to 2 cm. broad, above appressed short-setulose or glabrate, beneath pale, minutely setulose on the nerves: peduncle 6 to 9 cm. long, about equalling the leafy lower portion of the plant; raceme becoming 1 dm. or so long; verticels 3-6-flowered, the lower 4 cm. apart, the upper rather approximate: bracts pilose-hispid, colored, soon deciduous: calyx densely pilose-hispid with fine viscid hairs, in anthesis 5 to 7 mm. long; the tube twice as long as the broad abruptly subulate-tipped lobes: corolla 1.5 cm. long, the tube slightly exerted, the dark blue lip with a pale spot in its centre twice exceeding the puberu-



lent blunt oblong galea: style bearded. — SINALOA, foothills of the Sierra Madre near Colomas, July 14, 1897 (*J. N. Rose*, no. 1727).

← ← Leaves nearly all with definite petioles. (*S. comosa* and *S. sinaloensis* may be looked for here.)

→ → Annuals, more or less bushy-branched: racemes elongated, at least the lower verticels remote.

= Leaves linear-lanceolate to oblong-linear, obscurely serrate: bracts lanceolate.

36. *S. LANCEOLATA*, Brouss. App. Elench. Pl. Hort. Monsp. (1805) 15; Willd. Enum. Hort. Berol. i. 37; Jacq.f. Eclog. i. 22, t. 13; Benth. l. c. 299; Gray, l. c. 369; Hemsl. l. c.; Briq. l. c. *S. reflexa*, Horn. Hort. Hafn. (1807), i. 34. *S. lanceifolia*, Poir. Suppl. v. 49. *S. aspidophylla*, R. & S. Syst. Mant. i. 206. *S. trichostemoides*, Pursh, Fl. i. 19. *S. aegyptiaca*, Sessé & Moc. l. c. 6, not L. — Florida and S. W. United States to Central Mexico. Without locality, 1848–49 (*Gregg*, no. 541): CHIHUAHUA, low ground near Chihuahua, Oct. 1852 (*Geo. Thurber*, no. 821); plains near Chihuahua, Sept. 11, 1885 (*C. G. Pringle*, no. 654); damp places near Pílares, Sept. 23, 1891 (*C. V. Hartman*, no. 744): COAHUILA, abundant in abandoned fields and bottom-lands, Saltillo, Sept., 1898 (*Edw. Palmer*, no. 336): DURANGO, abundant in rich bottom-lands, near Durango, July, 1896 (*Edw. Palmer*, no. 327); along arroyos, Santiago Papasquiaro, Aug., 1896 (*Edw. Palmer*, no. 446); between Cerro Prieto and La Providencia, Sept. 11, 1898 (*E. W. Nelson*, 4969): SAN LUIS POTOSÍ, damp places about the city, 1876 (*Schaffner*, no. 673); alt. 1,840 to 2,460 m., 1878 (*Parry & Palmer*, no. 744): GUANAJUATO, Presa de la olla, 1893 (*A. Dugès*): QUERETARO, Nov. 19, 1827 (*Berlandier*, no. 1279).

= = Leaves lanceolate or oblong-lanceolate, coarsely subincised-dentate: bracts broadly ovate.

37. *S. SUBINCISA*, Benth. Pl. Hartw. 20, & in DC. l. c. 303; Gray, l. c.; Hemsl. l. c. 565; Briq. l. c. — Texas to Central Mexico. CHIHUAHUA, Pílares, Sept. 18, 1891 (*C. V. Hartman*, no. 776): DURANGO, rich low ground near Durango, July, 1896 (*Edw. Palmer*, no. 305): AGUAS CALIENTES, in fields near the city (*Hartweg*, no. 160). Originally described from Hartweg's plant.

= = = Leaves ovate or narrowly rhombic-ovate, crenate-serrate: bracts narrowly ovate with long attenuate barbulate tips.

38. *S. Chia*. Similar to the two preceding: about 6 dm. high, with long internodes (the lower 5 to 7 cm. long): stem strongly quadrangular, puberulent with appressed white hairs, densely white-pilose at the nodes:

leaves bluntish at tip, cuneate at base to a long slender petiole, coarsely crenate-serrate, especially above the subentire base; margin and petiole densely short-pilose; upper face dark green, puberulent or glabrate; lower face paler, minutely pubescent: racemes very short-pedunculate, 0.5 to 2 dm. long; verticels 3-6-flowered, the lower 1.5 cm. apart, the upper approximate: pedicels 3 mm. long, minutely white-pilose: calyx ciliate on the strong nerves, narrowly campanulate, in anthesis 8 mm. long; the tube twice exceeding the ovate acuminate lobes; upper lip entire: corolla 1.3 to 1.5 cm. long, the white tube somewhat exerted; lips blue, the lower pubescent beneath, twice as long as the pubescent upper one: style glabrous. — COAHUILA, damp bottom-lands, Saltillo, Sept., 1898 (*Edw. Palmer*, no. 334). This as well as three other species, *S. lanceolata*, *S. tiliaefolia*, and *S. hispanica*, are called *chia* by the Mexicans, and a cooling beverage known likewise by that name is prepared from the seed. (See Rose, Contr. U. S. Nat. Herb. v. 225.)

↔ ↔ Perennials, mostly decumbent at least at base.

= The lower verticels becoming remote.

a. Corolla white or pale: stem strongly decumbent or subrepent: leaves ovate-elliptic to oblong, glabrate: peduncle 0.5 to 1.5 dm. long.

39. *S. ASSURGENS*, HBK. Nov. Gen. & Spec. ii. 293; Benth. l. c. 304; Hemsl. l. c. 553; Briq. l. c. — MICHOCAN, grassy hills near Patzcuaro, July 18, 1892 (*C. G. Pringle*, no. 4150); Oct. 20, 1898 (*E. W. D. Holway*, no. 3184); originally collected near the same town, alt. 2,100 m., by Humboldt & Bonpland. According to Kunth the color of the corollae is "pallide violacea? (carnea ex Bonpl.)," but neither of the recently collected specimens shows any violet tinge.

b. Corolla blue or violet.

1. Pilose-hirsute: internodes short: leaves oblong to rhombic-ovate: calyx hispid below, in anthesis 5 to 7 mm. long; tube equalling the lobes; upper lip tridentate or entire.

40. *S. PRUNELLOIDES*, HBK. l. c. 289; Benth. l. c. 305; Hemsley, l. c. 563; Briq. l. c. *S. glechomaefolia*, Wats. Proc. Am. Acad. xviii. 137, not HBK. *S. tricandra*, Briq. Ann. Conserv. Jard. Bot. Genève, ii. 133. — Coahuila to Oaxaca. COAHUILA, mountains 64 km. south of Saltillo, July, 1880 (*Edw. Palmer*, no. 1098); limestone hills, Carneros Pass, Sept. 27, 1890 (*C. G. Pringle*, no. 3681): NUEVO LEON, Lerios, July, 1880 (*Edw. Palmer*, no. 1097): DURANGO, Cacaria, Aug. 5, 1898 (*E. W. Nelson*, no. 4651): MEXICO, without locality, 1848-49 (*Gregg*, no. 406); cool slopes, Sierra de las Cruces, Aug. 21, 1892 (*C. G. Prin-*



gle, no. 4200): OAXACA, Cuilapan, alt. 1,840 m., June 27, 1895 (*L. C. Smith*, no. 778). Originally from Volcan de Jorullo, MICHOACAN. Briquet bases his species *S. trichandra* upon Pringle's no. 4200, stating in his description of the calyx that the upper lip is entire. In the specimens of this number, as represented in the Gray Herbarium, the upper lip is usually tridentate, thus placing the plant distinctly with *S. prunelloides*.

2. Puberulent: internodes longer: leaves oblong or narrowly ovate-oblong: calyx puberulent, tubular-campanulate, in anthesis 7 to 8 mm. long, the tube one half longer than the lobes; upper lip entire.

41. *S. OBLONGIFOLIA*, Mart. & Gal. l. c. 79; Benth. l. c.; Hemsl. l. c. 562; Briq. in Engl. & Prantl, l. c. *S. reticulata*, Mart. & Gal. l. c. 64, acc. to Benth. — Southern Mexico. CHIAPAS, without locality, July, Aug., 1864-70 (*Ghiesbreght*, nos. 61, 750); near San Cristobal, alt. 2,150 to 2,460 m., Sept. 18, 1895 (*E. W. Nelson*, no. 3191). Originally described from OAXACA.

= = Verticels congested in a long-peduncled head: stem pilose-hispid, 2 to 2.5 dm. high: leaves ovate-elliptic or ovate-oblong, obtuse: heads 1 to 1.5 cm. high.

42. *S. TATEI*, Briq. Ann. Conserv. Jard. Bot. Genève, ii. 135. — Mexico, without indicated locality in herb. Delessert. Not seen.

\* \* \* Bracts deciduous: calyx cylindric, not becoming inflated, less conspicuously bilabiate: stems numerous from a woody base.

+ Bracts very early deciduous: calyx blue-tinged, conspicuously nerved, puberulent or short-pubescent.

↔ Verticels, or all but the lowermost, aggregated, forming a rather dense head.

= Stems 1 m. or less high, finely canescent: leaves 2 to 8 cm. long, soft-canescant beneath: heads simple or branched, 2 to 12 cm. long: calyx, in anthesis, 5 to 7 mm. long; the tube thrice exceeding the deltoid subulate-acuminate lobes: corolla blue rose or white.

43. *S. LAVENDULOIDES*, HBK. Leaves lanceolate, oblanceolate, or oblong-lanceolate, acutish or blunt, crenulate. — Nov. Gen. & Spec. ii. 287; Benth. l. c. 303; Hemsl. l. c. 559; Briq. l. c. *S. Humboldtiana*, R. & S. Syst. Mant. i. 183. *S. lavendulaefolia*, Spreng. Syst. i. 58, not Vahl. *S. purpurina*, La Llave, La Nat. vii. 82. *S. stricta*, Sessé & Moc. l. c. 8. — Southern Mexico and Central America. MEXICO, Valley of Mexico (*Bourgeau*, no. 1110, *Schaffner*, no. 410): MICHOACAN, hills of Patzcuaro, Nov. 21, 1891 (*C. G. Pringle*, no. 3954): MORELOS, Cuernavaca, alt. 2,300 m., Jan. 4, 1899 (*C. C. Deam*, no. 2): OAXACA, N. W. slope of Mt. Zempoaltepec, alt. 2,460 to 3,000 m., July 10, 1894 (*E. W. Nelson*, no. 701): Cuyamecalco, alt. 2,000 m., Sept. 4, 1895 (*L. C. Smith*,

no. 601): CHIAPAS, without locality, 1864-70 (*Ghiesbreght*, nos. 738, 741, 747); near San Cristobal, alt. 2,150 to 2,460 m., Sept. 18, 1895 (*E. W. Nelson*, no. 3142): GUATEMALA, Santa Rosa, Depart. Baja Verapaz, alt. 1,530 m., April, 1887 (*H. von Tuerckheim* in exsicc. J. D. Smith, no. 1193); Santiago, Depart. Zacatepéquez, alt. 2,000 m., 1891 (*Rosaldo Gómez* in exsicc. J. D. Smith, no. 823); Sacabajá, Depart. Quiché, alt. 1,230 m., March, 1892, and Castillas, Depart. Santa Rosa, alt. 1,230 m., Dec., 1892 (*Heyde & Lux* in exsicc. J. D. Smith, nos. 3128, 4395). Originally described from Patzcuaro, MICHOACAN.

Var. *LATIFOLIA*, Benth. Leaves elliptic-oblong, acute. — Pl. Hartw. 21, & in DC. l. c. — JALISCO, Bolaños (*Hartweg*, no. 171).

— = Similar: stems minutely retrorse-pubescent: leaves not canescent beneath.

- a. Leaves oblong or narrowly ovate-elliptic, 1.5 to 3 cm. long, thickish, rugose, green, sometimes a little pubescent on the nerves beneath, obscurely crenate or entire: lower verticels a little remote: calyx 5 to 6 mm. long the upper lip very short, the lower with 2 ovate lobes 1 mm. long.

44. *S. GUADALAJARENSIS*, Briq. Ann. Conserv. Jard. Bot. Genève ii. 132. *S. helianthemifolia*, var., Gray in Wats. Proc. Am. Acad. xxii. 445, not *S. helianthemifolia*, Benth. — JALISCO, among rocks, Rio Blanco, Sept., 1886 (*Edw. Palmer*, no. 556); dry rocky hills near Guadalajara, Nov. 1, 1893 (*C. G. Pringle*, no. 4624).

- b. Leaves lanceolate or oblong-linear, bluntish, dull, minutely puberulent or glabrate: deltoid acuminate calyx-lobes subequal.

1. Stems numerous, assurgent, 2 to 2.5 dm. high, leafy chiefly near the base: leaves entire, glaucous: calyx white-puberulent, in anthesis 6 mm. long.

45. *S. Teresae*. Leaves short-petioled, 2 to 2.5 cm. long, 0.25 to 0.5 cm. broad: peduncles 1 to 1.5 dm. long; raceme rather loosely flowered; the lower verticels 1 cm. apart, 2-6-flowered: bracts ovate-lanceolate, acuminate: calyx dark blue: corolla 1.3 cm. long, the galea densely pubescent. — TEPIC, near Santa Teresa, top of Sierra Madre, Aug. 13, 1897 (*J. N. Rose*, no. 2233).

2. Stems few, erect, 6 to 8 dm. high: leaves remote, serrate, not glaucous: calyx minutely pubescent, not whitened, in anthesis 4 to 5 mm. long.

46. *S. muscarioides*. Stems simple or sparingly branched; internodes 1 dm. or less long; leaves short-petioled, 5 to 6 cm. long, 0.75 to 1.5 cm. wide: peduncles 2 dm. or less long: bracts minute, caducous: lower verticels 2 or 3 cm. apart, the others crowded, 8-20-flowered: pedicels spreading and drooping: calyx dark blue and green: corolla 1.2 cm. long; the lower lip much exceeding the pubescent galea: style slightly exserted, bearded. — Northwestern Mexico. CHIHUAHUA, base

of Mt. Mohinora, 13 km. from Guadalupe y Calvo, alt. 2,150 to 2,310 m., Aug., 1898 (*E. W. Nelson*, no. 4850). Inflorescence, as also that of related species, suggesting *Muscari botryodes*.

↔ ↔ Verticels mostly remote, forming an elongate loose raceme.

= Stem 5 to 6 dm. high: leaves oblong, blunt or acutish: racemes 2.5 dm. long or less; verticels 6-20-flowered, lower 4 to 5 cm. apart, upper approximate: calyces reflexed: corolla 1 cm. long, the tube included or short-exserted.

47. *S. HELIANTHEMIFOLIA*, Benth. Lab. 254, & in DC. l. c. 304; Hemsl. l. c. 557; Briq. in Engl. & Prantl, l. c. — South-central Mexico. SAN LUIS POTOSI, alt. 1,840 m., 1878 (*Parry & Palmer*, no. 729): HIDALGO, Sierra de Pachuca, alt. 3,000 m., Sept. 14, 1899 (*C. G. Pringle*, no. 8222): MICHOACAN, near Tlalpujahua (*Graham*). Described from Graham's material from Tlalpujahua and from San Martin, PUEBLA.

= = Similar: leaves oblong-lanceolate, acute, serrate: verticels subequally remote: calyces less reflexed: corolla-tube equalling the calyx.

48. *S. REMOTA*, Benth. l. c.; Hemsl. l. c. 564; Briq. l. c. Described from Mexico without definite locality.

+ + Bracts hardly persistent, lower verticels becoming slightly remote: nerves of calyx hidden by the long appressed silky pubescence.

49. *S. cryptodonta*. Resembling *S. lavenduloides*: stems canescent: leaves narrow-oblong, blunt, crenate-serrate, 2 to 5 cm. long, 0.5 to 1.5 cm. wide, rugose, green and appressed-setulose above, white-tomentose beneath, short-petioled: raceme 2 to 5 cm. long; bracts ovate-lanceolate, acuminate, ascending: calyx blue, in anthesis 5 mm. long, the short teeth obscured by the dense silky hairs: corolla 1 cm. long, the tube barely exserted; galea pilose, half as long as the lip. — DURANGO, Aug. 16, 1897 (*J. N. Rose*, no. 2338).

+ + + Bracts persistent through anthesis, their slender tips conspicuous: nerves of calyx somewhat hidden by long hairs: heads very dense.

= Leaves lanceolate, slightly canescent: the long-peduncled heads 3 to 5 cm. in length: bracts ascending: calyx white-villous.

50. *S. STACHYOIDES*, HBK. l. c. t. 138; Benth. l. c. 303; Hemsl. l. c. 565; Briq. l. c. — Southern Mexico. OAXACA, 29 km. S. W. of the city of Oaxaca, alt. 2,300 to 2,920 m., Sept., 1894 (*E. W. Nelson*, no. 1387). Originally from Los Joares and Santa Rosa.

= = Leaves oblong, glabrous or slightly puberulent: heads 2 to 13 cm. long: bracts more spreading: calyx pilose-hirsute.

51. *S. ELONGATA*, HBK. l. c. t. 139; Benth. l. c.; Hemsl. l. c. 556. *S. Betonica*, R. & S. l. c. 188. *S. simplex*, Spreng. Syst. i. 58. — South-

central Mexico. MEXICO, Valley of Mexico, Sept. 7, 1865-66 (*Bourgeau*, no. 859); wooded cañons, Sierra de las Cruces, Oct. 2, 1892, and Serrania de Ajusco, alt. 3,075 m., Sept. 11, 1897 (*C. G. Pringle*, nos. 4278, 7457). Originally from the region of Ario, MICHOACAN.

508 *B. Acaulæ*. Similar to *Angustifoliae* but tending to be acaulescent or subacaulescent, the obovate canescent basal leaves forming a rosette: peduncle 0.5 to 2.5 dm. high; raceme as long; the verticels remote.

52. *S. NANA*, HBK. l. c. 289; Benth. in DC. l. c. 304; Hemsl. l. c. 561; Briq. l. c. *S. prunelloides*, Benth. Pl. Hartw. 90, 351, not HBK. *S. rhombifolia*, Sessé & Moc. l. c. 8. — Northern Mexico to Central America. DURANGO, El Salto, July 12, 1898 (*E. W. Nelson*, no. 4566): ZACATECAS, near San Juan Capistrano, Aug. 18, 1897 (*J. N. Rose*, no. 3534): SAN LUIS POTOSI, rare in the mountains, San Rafael, 1876 (*Schaffner*, no. 680); alt. 1,840 m. (*Parry & Palmer*, no. 745, 746): GUANAJUATO, 1893 (*A. Dugès*, no. 228 B): OAXACA, Boca de Leon, Telixtlahuaca, June 27, 1895 (*L. C. Smith*, no. 414). Originally from GUANAJUATO.

519 *C. Vulgares*, Benth. Branching or sometimes simple herbs, rarely half-shrubs: leaves petioled, ovate, rarely oblong, membranaceous, rounded round-cuneate or subcordate at base. (*S. prunelloides* and *S. Martensii* may be looked for here.)

• Annuals.

— Coarse more or less canescent plant with long-petioled pale-green leaves and peduncled spiciform heads with persistent foliaceous broad bracts.

53. *S. HISPANICA*, L. Spec. 25; Edw. Bot. Reg. v. t. 359; Benth. in DC. l. c. 308; Hemsl. l. c. 558; Briq. in Engl. & Prantl, l. c. 279. *S. tetragona*, Moench, Meth. 373. *S. prismatica*, Cav. fide Hemsl. l. c. *S. neo-hispanica*, Briq. Ann. Conserv. Jard. Bot. Genève, ii. 137. — From western Texas and Coahuila to northern South America and the West Indies. Introduced into southern Europe, whence the specific name. COAHUILA, Carneros Pass, Sept. 27, 1890 (*C. G. Pringle*, no. 3683): DURANGO, sides of arroyos, Santiago Papasquiaro, Aug., 1896 (*Edw. Palmer*, no. 967); bottom-lands, Durango, Oct., 1896 (*Edw. Palmer*, no. 757): SAN LUIS POTOSI, sand near the city, 1876 (*Schaffner*, nos. 675, 1053): GUANAJUATO, 1895 (*A. Dugès*): JALISCO, Rio Blanco, Oct., 1886 (*Edw. Palmer*, no. 659): VERA CRUZ, Orizaba (*Botteri*, no. 534): MEXICO, Santa Fé, Oct. 15, 1865-66 (*Bourgeau*, no. 1109): OAXACA, near Reyes, alt. 1,800 to 2,600 m., Oct. 20, 1894 (*E. W. Nelson*, no. 1782); Jayacatlan, alt. 1,350 m., Nov. 4, 1894

(*L. C. Smith*, no. 268): GUATEMALA, Buena Vista, Depart. Santa Rosa, alt. 1,700 m., Dec., 1892 (*Heyde & Lux* in exsicc. *J. D. Smith*, no. 4401). Frequently cultivated in Mexico as "Chia-blanco" — see note under *S. Chia* above.

— — Delicate, not canescent: leaves short-petioled: bracts small, deciduous.

54. *S. flaccida*. Slender, 2 to 3 dm. high, simple or branching from the base, puberulent below, more or less glandular-pilose above: leaves very thin and flaccid, glabrous and lucid or minutely hispidulous on the nerves beneath, from rhombic-ovate to oblong-ovate, short-acuminate, coarsely appressed-serrate, cuneate and entire at base, the uppermost largest, 4 to 6 cm. long, 2 to 3.5 cm. broad; petioles slender, puberulent, 0.5 to 1.5 cm. long; peduncle 4 to 5 cm. long; raceme short, 2 to 3 cm. long, of 2 or 3 remote 3-6-flowered verticels: bracts lanceolate: pedicels 3 mm. long: calyx minutely glandular-hispidulous, narrow-campanulate, in anthesis nearly 1 cm. long; the upper lip bluish, entire, ovate, bluntly mucronate; the lower lip paler, with 2 lance-attenuate lobes: corolla 2 to 2.5 cm. long, the white tube one half longer than the calyx, hardly ventricose; galea blue, puberulent, one half as long as the broad white lip. — Southern Mexico and adjacent Central America. CHIAPAS, between Tumbala and El Salto, alt. 460 to 1,380 m., Oct. 29, 1895 (*E. W. Nelson*, no. 3374): GUATEMALA, in woods, Rubeleruz, Depart. Alta Verapaz, alt. 770 m., Oct., 1885 (*H. von Tuerckheim* in exsicc. *J. D. Smith*, no. 780).

\* \* Perennials.

— Erect or suberect, branching mostly above the base, leafy nearly or quite to the inflorescence.

— Leaves rounded rounded-truncate or subcordate at base, not tapering to the distinct petioles.

= Calyx in anthesis about 3 mm. long.

a. Racemes terminal and from the upper axils, panicked, and often branching: leaves pale green, glaucous beneath: calyx minutely puberulent, with very short broad-deltoid teeth.

1. Racemes 2 to 7 cm. long, compactly flowered: pedicels 1 mm. long.

55. *S. BREVICALYX*, Benth. in DC. l.c. 309; Hemsl. l.c. 553. — Southern Mexico. GUERRERO, between Ayuainapa and Petatlan, alt. 1,530 to 2,150 m. Dec. 14, 1894, and at top of Sierra Madre near Chilpancingo, alt. 2,770 to 3,140 m., Dec. 24, 1894 (*E. W. Nelson*, nos. 2146, 2220): OAXACA, mountains near Tlapancingo, alt. 1,840 to 2,460 m., Dec. 7, 1894 (*E. W. Nelson*, no. 2064). Originally from OAXACA.

2. Racemes longer, slender: pedicels 2 to 3 mm. long, equalling the calyx.

56. *S. FILIPES*, Benth. l. c.; Hemsl. l. c. 556. *S. polystachya*, var., Benth. Pl. Hartw. 50, not *S. polystachya*, Ort. Described from Regla. Not seen.

- b. Racemes short, simple, solitary, or paniculate, with some remote lower verticels in the axils of the upper foliar leaves: calyx hispidulous, with short deltoid-subulate teeth.

57. *S. menthiformis*. Tall herb, 6 to 8 dm. high: stems strongly angular and furrowed, cinereous-puberulent, freely branching: leaves ovate or orbicular-ovate, acuminate, round-cordate at base, crenulate-serrate, 1.5 to 5 cm. long, 1 to 3.5 cm. broad, dark green and glabrate above, pale and minutely puberulent or glabrate beneath, on slender cinereous-puberulent petioles 1 to 2 cm. long; raceme, excluding the remote axillary verticels, 2 to 5 cm. long; the crowded verticels 6-20-flowered: pedicels barely 1 mm. long: corolla blue, pilose, 1.2 cm. long; the tube twice exceeding the calyx; the lip hardly equalling the galea: style glabrous or slightly bearded. — *S. polystachya*, Donnell Smith, Enum. Pl. Guat. iv. 126, not Ort. *S. purpurea*, Donnell Smith, l. c. in part, not Cav. — COSTA RICA, Cartago, alt. 1,300 m., Oct., 1887 (*Juan J. Cooper* in exsicc. J. D. Smith, no. 5902); San Francisco de Guadalupe, alt. 1,200 m., Jan., 1894 (*A. Tonduz*, no. 1781); Rio Turrialba, Prov. Cartago, alt. 500 m., March, 1894 (*J. D. Smith*, no. 4919). Habitally resembling forms of *Mentha aquatica*.

- c. Racemes simple, with no axillary lower verticels.

1. Raceme spiciform, densely flowered, 4 to 10 cm. long: leaves broad-ovate, 1 dm. long, 6 dm. wide, on long petioles: corolla white.

58. *S. CATARIA*, Briq. Ann. Conserv. Jard. Bot. Genève, ii. 142. Described from COSTA RICA. No specimen seen.

2. Raceme elongate, loosely-flowered, at least the lower verticels remote.

- Leaves broad-ovate, glabrous, coarsely and irregularly serrate: pedicels 2 to 4 mm. long.

59. *S. BRACHYDONTA*, Briq. l. c. 149. *S. albiflora*, var. *caerulescens*, Gray in Wats. Proc. Am. Acad. xxii. 445, in part. — JALISCO, on sides of cañons, Rio Blanco, Sept., 1886 (*Edw. Palmer*, no. 598); hillsides near Guadalajara, Sept. 27, 1889 (*C. G. Pringle*, no. 2463). Placed by Briquet under the group *Cordifoliae*, Benth., but the leaves are rounded-truncate at base, not cordate, and in habit as well the plant much more resembles members of the *Vulgares*.



- ○ Leaves narrow-ovate, lanate beneath in the axils of the nerves, finely and regularly serrate: pedicels 1 mm. long.

60. *S. Ghiesbreghtii*. Tall, 1 m. (?) or less high: stems puberulent, with long ascending branches: leaves long-acuminate, rounded at base, 3 to 6 cm. long, 1 to 3 cm. wide, puberulent above, pilose or glabrate beneath, except for the often densely lanate mid-nerve, on petioles 1 cm. or less in length: racemes slender, flexuous, 1 to 2.5 dm. long; verticels 10–20-flowered, the lower 1.5 cm. apart: bracts small, ovate-attenuate, caducous: calyx hispid, with short-deltoid ciliate subulate-tipped teeth: corolla pale blue, pilose, 1.2 cm. long; the ventricose tube twice exceeding the calyx; galea and lip subequal: style bearded. — *S. polystachya*, Hemsl. l. c. 563, in part, not Ort. — CHIAPAS, among the mountains, July, 1864–70 (*Ghiesbreght*, nos. 129, 743).

= = Calyx in anthesis about 5 mm. long.

- a. Lower surfaces of firm leaves the pedicels and the calyces permanently canescent with fine stellate pubescence.

61. *S. PALMERI*, Gray, Proc. Am. Acad. xxi. 408. — CHIHUAHUA, hillsides at the Frailes, on the mountains above Batopilas, 1885 (*Edu. Palmer*, no. 259).

- b. Lower surfaces of leaves the pedicels and the calyces canescent with appressed short hairs: racemes very elongated, the verticels subequally remote: broad lip of corolla much exceeding the galea.

62. *S. LEPTOSTACHYS*, Benth. Lab. 258, & in DC. l. c. 308; Hemsl. l. c. 560; Briq. in Engl. & Prantl, l. c. — South central Mexico. JALISCO, near Plateado, Aug. 31, 1897 (*J. N. Rose*, no. 2682): MORELOS, hills near Cuernavaca, Nov. 10, 1895 (*C. G. Pringle*, no. 7078).

- c. Lower surfaces of leaves canescent-tomentose, glabrate or glabrous: calyx villous or hirsute: galea and lip of corolla subequal.

63. *S. POLYSTACHYA*, Ort. Leaves broad-ovate, tomentose beneath: racemes paniced: calyx canescent, villous. — Dec. 55; Cav. Ic. i. 17, t. 27; HBK. l. c. 296; Benth. l. c.; Hemsl. l. c. 563; Briq. l. c. *S. linearifolia*, Lag. Nov. Gen. & Spec. 2. *S. Durandiana* (as subspecies), Briq. Bull. Soc. Bot. Belg. xxx. 238, & Ann. Conserv. Jard. Bot. Genève, ii. 138. — An extremely variable species, the typical form seen only from MICHOACAN, Talpujahua (*Graham*).

Var. *CAESIA*, Briq. Leaves narrow-ovate to ovate-lanceolate, glaucous, glabrous or minutely pubescent, not tomentose, beneath: inflorescence as in the type but racemes more elongated, the lower verticels often remote:



calyx generally with shorter pubescence. — Bull. Soc. Bot. Belg. xxx. 236 & Ann. Conserv. Jard. Bot. Genève, l. c. *S. caesia*, Willd. Enum. i. 40; HBK. l. c. 295. — Central Mexico to Central America. HIDALGO, Guadalupe, Valley of Mexico, Aug., 1865–66 (*Bourgeau*, nos. 721, 854), Aug. 17, 1865 (*Bilimek*, no. 316): MEXICO, Takubaya, Aug. 28, 1865 (*Bilimek*, no. 315): OAXACA, near Puebla, alt. 2,150 m., Nov. 9, 1895 (L. C. Smith, no. 908).

Var. *philippensis*. Leaves as in the species: racemes simple, elongated, 1 to 2 dm. long: calyx short villous. — OAXACA, Sierra de San Felipe, alt. 2,300 m., Sept. 1, 1894 (*E. W. Nelson*, no. 1175), Oct. 5, 1894 (*C. G. Pringle*, no. 4953).

Var. *seorsa*. Similar to the last: leaves glabrate beneath: racemes simple, elongated; verticels many-flowered, the lower 2 to 3 cm. apart. — MEXICO, Valley of Mexico, Sept. 19, 1889 (*C. G. Pringle*, no. 2818).

Var. *albicans*. Leaves ovate, thinner than in the other forms, slightly canescent above, very white-tomentose beneath: racemes simple, 1 to 1.5 dm. long: calyx densely white-villous. — *S. purpurea*, var. *pubens*, Donnell Smith, l. c. iii. 67, not Gray. — GUATEMALA, Santa Rosa, Depart. Santa Rosa, alt. 920 m., Nov., 1892 (*Heyde & Lux* in exsicc. J. D. Smith no. 4394). An extremely canescent plant.

Var. *POTOSINA*, Briq. l. c. Leaves ovate-lanceolate or lanceolate, long-acuminate, pubescent as in the species: racemes simple, 1 dm. or less long: calyx hirsute. — SAN LUIS POTOSI, San José Pass, July 23, 1890 (*C. G. Pringle*, no. 3224).

d. Leaves pilose-hispid or glabrate beneath: stems and calyces pubescent with slender spreading glandular hairs.

64. *S. aequidistans*. Erect or ascending: stems 1.5 to 4 dm. high, glandular-hirsute: leaves rather remote, the lower small, the upper much larger, oblong-ovate to broadly deltoid-ovate, obtuse, the uppermost 3 to 4.5 cm. long, crenate-serrate, more or less setulose above: racemes slender, elongated, 0.5 to 2 dm. long; the verticels 2–6-flowered, all remote, the lower equidistant, 2 to 3 cm. apart: pedicels filiform, 2 to 4 mm. long: calyx campanulate, strongly bilabiate, the tube twice or thrice as long as the ovate lips; upper lip entire, lower short-cleft: corolla 1.3 cm. long, the pilose or glabrate tube ventricose, nearly twice exceeding the calyx; lip a little exceeding the pilose galea: style bearded. — SINALOA, between Rosario and Colomas, July 12, 1897 (*J. N. Rose*, no. 1609).

== = Calyx in anthesis 6 to 8 mm. long.

- a. Leaves broad-ovate, crenate-serrate, obtuse: bracts large, broad-ovate: upper lip of purple glandular-hairy calyx tridentate: corolla dark-blue, with the calyx, bracts, &c., red-dotted.

65. *S. TRICUSPIDATA*, Mart. & Gal. l. c. 78; Benth. l. c. 311; Hemsl. l. c. 566. — OAXACA, Sierra de San Felipe, alt. 3,080 m., Aug. 28, 1894 (*C. G. Pringle*, no. 4845). Originally collected by Galeotti in the same mountains.

- b. Leaves incised-serrate, acuminate: bracts minute, lance-subulate: calyx blue and green, minutely hispidulous, upper lip entire: corolla paler blue without red dots.

66. *S. PRASHIFOLIA*, Benth. Bot. Sulph. 151, & in DC. l. c. 310; Hemsl. l. c. 563. *S. aliena*, Greene, Pittonia, i. 157. — TEPIC, Maria Madre Island, April, 1877 (*W. T. Fisher*), May, 1897 (*E. W. Nelson*, no. 4247). Originally described from Tepic.

→ → → Five species are not identified with recent material.

From the descriptions alone it is impossible to make out their exact relationships, or whether they are all distinct from the species here defined. These five plants are: — *S. GRACILIS*, Benth. Lab. 258, & in DC. l. c. 307, described from "New Spain"; *S. PROTRACTA*, Benth. in DC. l. c. 309, described from OAXACA; *S. MEMBRANACEA*, Benth. Lab. 259, & in DC. l. c. 310, described from "Mexico"; *S. GLABRA*, Mart. & Gal. l. c. 68, Benth. l. c., described from OAXACA; *S. HERBACEA*, Benth. Lab. 720, & in DC. l. c. 311, described from Tehuantepec, OAXACA.

→ → → Leaves cuneate at base, or at least attenuate to the petioles.

= Leaves white-villous or pilose beneath.

a. Herbaceous.

1. Raceme dense, 4 to 7 cm. long: leaves densely villous beneath.

○ Leaves thick, crenulate-serrate.

67. *S. XALAPENSIS*, Benth. l. c. 308; Hemsl. l. c. 566; Briq. in Engl. & Prantl, l. c. *S. polystachya*, Mart. & Gal. l. c. 77, not Ort. — Southern Mexico. VERA CRUZ, Jalapa, alt. 1,230 to 1,380 m., Jan. 16, 1894 (*C. L. Smith*, nos. 1749, 1756); near Motzorongo and Omealca, Feb. 22, 1894 (*E. W. Nelson*, nos. 132, 177).

○○ Leaves thin, sharply serrate.

68. *S. LONGISPICATA*, Mart. & Gal. l. c. 73; Benth. l. c. 307; Hemsl. l. c. 560; Briq. l. c. — Southwestern Mexico. GUERRERO, between  
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Copala and Juchitango, alt. 60 to 185 m., Feb. 9, 1895 (*E. W. Nelson*, no. 2300). Originally collected by Galeotti in MICHUACAN.

2. Racemes looser, elongated, the terminal one 1 to 3 dm. long: leaves less densely villous.

○ Calyx in anthesis 4 to 5 mm. long: corolla 1 cm. long.

69. *S. CORDOBENSIS*, Briq. Ann. Conserv. Jard. Bot. Genève, ii. 140. — Vera Cruz, Valley of Cordova, Aug. 24, 1866, and region of Orizaba, Aug. 12, 1866 (*Bourgeau*, nos. 1591, 2857); Cordova, alt. 790 m., Aug. 20, 1891 (*Seaton*, no. 431): PUEBLA, near Metlatoyuca, alt. 250 m., Feb. 27, 1898 (*E. A. Goldman*, no. 72).

○○ Calyx in anthesis 8 to 9 mm. long: corolla 2 cm. long.

70. *S. monclovensis*. Stems sparingly pilose or glabrate: leaves ovate, acuminate, coarsely crenate-serrate, the primary ones 7 to 8 cm. long, unequally cuneate or rounded-cuneate at base, dark green and minutely puberulent above, canescent beneath, on petioles 3 to 4 cm. long: peduncles 1 dm. or less long: verticels 4-8-flowered, the lowest 1.5 to 3 cm. apart: bracts narrow-ovate, long-acuminate, the lowest 1.5 cm. long, sometimes leaf-like and slightly toothed: calyx minutely appressed-pubescent; the tube thrice exceeding the broad-ovate ciliate mucronate-short-acuminate lobes: corolla blue, sparingly pilose; the tube one half longer than the calyx; the lip twice exceeding the galea: style bearded. — COAHUILA, Caracol Mts., 33.8 km. southeast of Monclova, Aug., 1880 (*Edw. Palmer*, no. 1096).

b. Shrubby at base: leaves thinly villous.

1. Stem erect, pubescent: leaves crenate-serrate: calyx-lobes broad ovate: galea of corolla glandular-pilose.

71. *S. WARSZEWICZIANA*, Regel, Flora, xxxii, 184; Walp. Ann. iii. 257; Hemsl. l. c. 566. — Described from GUATEMALA. No specimen seen.

2. Stem ascending, branches sordid-villous: leaves sharply serrate: lower calyx-lobes lance-ovate, long-attenuate: galea villous not glandular.

72. *S. SANCTAE-LUCIAE*, Seem. Bot. Herald, 327; Hemsl. l. c. 565. — Western Mexico. TEPIC, Tepic, Jan. & Feb., 1892 (*Edw. Palmer*, no. 1964). Originally from Santa Lucia in the Sierra Madre.

= = Leaves glabrous or puberulent beneath, only the nerves sometimes hispid or pilose, or the youngest minutely canescent-tomentulose.

a. Calyx in anthesis 3 to 4 mm. long.

1. Leaves green and glabrous on both sides: calyx campanulate and angulate below, enlarged-cupuliform above.

73. *S. JURGENSENII*, Briq. l. c. 144. Described from OAXACA.

2. Young leaves canescent-tomentulose at least beneath: calyx simply campanulate.

74. *S. mazatlanensis*. Stems slender, minutely puberulent or glabrate: leaves rhombic-ovate or deltoid-ovate, with long acuminate entire tips, and entire cuneate bases, otherwise coarsely appressed-serrate, thin, dark green above, pale beneath, 2 to 4 cm. long, 1 to 3 cm. wide, on slender petioles 2 cm. or less in length: racemes elongate, 0.5 to 2 cm. long; verticels 2-10-flowered, all somewhat remote, the lowest 1 to 1.5 cm. apart: bracts lance-subulate, caducous: pedicels 2 to 4 mm. long: calyx glabrate; the tube twice exceeding the lobes; upper lip broad-ovate, entire, blunt and submucronate, the lower with ovate-lanceolate acuminate lobes: corolla blue, 1 to 1.2 cm. long; galea pilose, nearly equalling the lip. — SINALOA, head of Mazatlan River, Jan., 1889 (*W. G. Wright*, no. 1298); Mazatlan, Dec. 29, 1894 (*F. H. Lamb*, nos. 351, 355). *Lamb's* no. 395 from Villa Union has thicker leaves and puberulent calyx, and may not belong with the Mazatlan plant, though it is nearer related to that than to any other species.

b. Calyx in anthesis 5 to 6 mm. long.

1. Branches cinereous: leaves cinereous-puberulent beneath, rhombic-ovate, coarsely crenate-serrate: racemes rather loosely flowered, 1 to 3 dm. long; verticels 2-15-flowered: calyx tubulose-campanulate, somewhat pilose on the nerves.

75. *S. JALISCANA*, Briq. l. c. 141. *S. albiflora*, Gray, Proc. Am. Acad. xxi. 408, not Mart. & Gal. *S. albiflora*, forma *caerulescens*, Gray, l. c. *S. albiflora*, var. *caerulescens*, Gray, acc. to Wats. Proc. Am. Acad. xxii. 445, in part. — Western Mexico. CHIHUAHUA, shady ravines near Batopilas, 1885 (*Edw. Palmer*, nos. 96, 154, 157): JALISCO, in ravines and by shaded roadsides, Guadalajara, Sept., 1886 (*Edw. Palmer*, no. 488); by streams near Guadalajara, Nov., 1888 (*C. G. Pringle*, no. 1798).

2. Leaves glabrous, glabrate, or merely pubescent on the nerves beneath.

- Leaves and calyces strictly glabrous: leaves with long-acuminate tips: calyx with short broad generally mucronate-tipped lobes.

76. *S. ALBIFLORA*, Mart. & Gal. l. c. 76; Benth. in DC. l. c. 307; Gray, Syn. Fl. l. c. 370; Hemsl. l. c. 552; Briq. in Engl. & Prantl, l. c. — Arizona to Venezuela. SONORA, moist places, Magdalena, Oct., 1857 (*Geo. Thurber*, no. 907): VERA CRUZ, Toluca, Dec. 24, 1898 (*C. C. Deam*, no. 57): OAXACA, Santo Domingo, alt. 290 m., June 12, 1895 (*E. W. Nelson*, no. 2668).

○ ○ Lower faces of leaves and nerves of calyces pubescent.

+ Verticels crowded into a dense spiciform raceme 5 to 6 cm. long: stem shrubby.

77. *S. PTEROURA*, Briq. Ann. Conserv. Jard. Bot. Genève, ii. 139. Described from COSTA RICA.

+ + Verticels becoming remote.

× Branches slender, glabrate: calyx tubular-campanulate, not enlarged above.

78. *S. Seemannii*. Frutescent (?): branches minutely pilose or glabrate, purplish; leaves elliptic-ovate, acuminate at the tip and at base to a slender petiole 1.5 to 3.5 cm. long, sharply serrate, above sparsely appressed-setulose, beneath minutely so on the nerves or glabrate, 4 to 7 cm. long, 2 to 4 cm. wide: raceme 1 dm. or less in length; verticels about 6-flowered, all a little remote, the lowest 1 cm. apart: bracts purple, lance-attenuate, persistent, slightly exceeding the setulose pedicels, 2 to 4 mm. long: calyx purple-tinged; the tube barely twice exceeding the lips; the upper lip broad-ovate, acuminate-subulate, the lower with lance-ovate acuminate lobes: corolla 1 cm. or so long, the tube a little exserted; galea pilose, equalling the lip: style bearded. — *S. flexuosa*, Seem. l. c. not Presl; Hemsl. l. c. 556, in part, with doubt. — Northwestern Mexico, in the Sierra Madre (*Seemann*).

× × Stems herbaceous, stout, densely puberulent in decussating bands: calyx slightly flaring above.

79. *S. fluviatilis*. Stems 1.5 m. or less high, very quadrangular: leaves rhombic-ovate, short-acuminate at tip, cuneate at base, crenate-serrate, the upper 5 to 9 cm. long, the lowermost broader, subtruncate at base, 1.5 dm. long, nearly as broad, puberulent above, especially on the nerves, cinereous beneath; petioles cinereous-puberulent, the lowest 5 cm. long, the others shorter: racemes slender, flexuous, the terminal becoming 2 dm. long; verticels 10–20-flowered, the lower remote, the lowest 1 cm. apart: bracts ovate, acuminate: pedicels filiform, becoming 2 to 3 mm. long: calyx green, strongly bilabiate, the tube twice exceeding the lips; the upper lip ovate, acuminate, entire, the lower with narrower attenuate lobes: corolla deep blue, pilose, 1 cm. long; the tube slightly exserted; galea about equalling the lip: style bearded. — MORELOS, by streams near Cuernavaca, alt. 1,540 m., May 16, 1898 (*C. G. Pringle*, no. 6850), Sept. 29, 1898 (*E. W. D. Holway*, no. 3028).

c. Calyx in anthesis 7 to 9 mm. long.

1. Stem and leaves glabrous: the latter 1 to 1.3 dm. long, serrate.

80. *S. ALVAJACA*, Oerst. Vidensk. Meddel. 1853, 38; Hemsl. l. c. 552. — Described from COSTA RICA. No specimen seen.

2. Stems and leaves pubescent, the stems glandular above.

○ Primary leaves 4 to 5 cm. long, crenate.

81. *S. RHOMBIFOLIA*, Ruiz & Pav. Fl. Per. & Chil. i. 26, t. 36, f. b.; Benth. l. c. 310; Hemsl. l. c. 564. — Doubtfully reported from Mexico by Benth. l. c.

○○ Primary leaves 1 dm. long, serrate.

82. *S. roscida*. Herbaceous? (only the top of the plant seen): stem closely glandular-puberulent above, the tip sparingly pilose; leaves very thin, elliptic-ovate, acuminate at both ends, coarsely and irregularly serrate, setulose-pilose above, sparingly so and minutely glandular-puberulent below; petioles slender, 5 cm. or less in length: racemes 1 to 1.5 dm. long; the verticels 6–12-flowered, all becoming remote, the lowest 3 to 4 cm. apart: bracts rhombic-ovate, long-acuminate, 6 to 8 mm. long: pedicels filiform, very glandular, 1 cm. or less in length: calyx glandular-puberulent, slightly setulose on the nerves, the long-attenuate lobes one half shorter than the cylindric-campanulate tube: corolla 1.8 cm. long, the tube exserted and slightly curved, glabrous, white; the blue lower lip somewhat exceeding the pilose galea: style included, bearded. — Northern Mexico. DURANGO, Chacala, alt. 920 m., March 5, 1899 (*E. A. Goldman*, no. 840).

+ Generally branching from the base, the stems slender and mostly decumbent: racemes long-peduncled. (Forms of *S. prunelloides* might be looked for here.)

→ Stems and leaves very setulose with long straight slender hairs.

= Leaves cuneate at base to short petioles or subsessile, obscurely crenate: bracts broad-ovate.

83. *S. VERONICAEFOLIA*, Gray in Wats. Proc. Am. Acad. xxii. 444. — JALISCO, on moist hillsides, Rio Blanco, June, 1886 (*Edw. Palmer*, no. 28); hillsides near Guadalajara, July 2, 1889 (*C. G. Pringle*, no. 2555).

= = Leaves truncate at base, coarsely crenate-dentate, long-petioled: bracts ovate-lanceolate.

84. *S. oreopola*. Stems repent at base, more or less assurgent, about 5 dm. long: leaves deltoid-ovate, dark green above, pale beneath, setulose on both surfaces, 2 to 3.5 cm. long, 1.5 to 3 cm. wide, on setulose petioles 1.5 to 2.5 cm. long: peduncles 7 to 10 cm. long; verticels 3–6-flowered, all becoming remote, the lowest 6 cm. apart: pedicels pubescent, 2 to 4 mm. long: calyx setulose, open-campanulate, strongly bilabiate; the broad purple upper lip blunt or acute, the lower with narrower



ovate-lanceolate acute lobes: corolla blue, 2 cm. long, the slightly pubescent tube twice exceeding the calyx; the blunt pilose galea one third as long as the broad lip: style densely bearded. — MORELOS, mountain side at 2,150 m. alt., near Cuernavaca, Aug. 9, 1898 (*C. G. Pringle*, no. 7643).

→ → Stems and leaves glandular-pilose, hardly setulose.

85. *S. villosa*. Stems 2.5 to 3 dm. high, glandular-pilose below, densely glandular-villous above and on the rhachis: leaves thick, pale green or cinereous, deltoid-ovate, mostly blunt at tip, subtruncate at base, entire or obscurely undulate, 1.5 to 3 cm. long, on cinereous-pubescent petioles 0.5 to 1.5 cm. long, the upper subsessile: peduncles 0.5 dm. long; verticels 3–6-flowered, all becoming remote, the lowest 2.5 to 3 cm. apart: bracts ovate, acuminate, setulose: pedicels slender, 2 to 3 mm. long: calyx blue-tinged, viscid, pilose-setulose, in anthesis 6 to 7 mm. long; the tube slightly longer than the lips; upper lips ovate, acuminate, entire, lower with two ovate acuminate lobes: corolla violet, 1.8 cm. long; the glabrous tube slightly exerted; the puberulent galea one third as long as the broad lip: style bearded. — SAN LUIS POTOSI, rare in the mountains, San Miguelito, 1876 (*Schaffner*, no. 678).

→ → → Stems and leaves mostly glabrous or puberulent or only sparingly setulose.

= Upper lip of calyx tridentate.

a. Calyx-tube hispid: leaves from orbicular to ovate-triangular, 3 to 6 cm. long, 2 to 4 cm. broad.

86. *S. GLECHOMAEFOLIA*, HBK. l. c. 290, t. 141; Benth. in DC. l. c. 306; Hemsl. l. c. 556; Briq. l. c. — South central and southern Mexico. SAN LUIS POTOSI, alt. 1,850 to 2,460 m., 1878 (*Parry & Palmer*, no. 756): OAXACA, near Reyes, alt. 2,060 to 3,070 m., Oct. 20, 1894 (*E. W. Nelson*, no. 1794). Originally from near Guanajuato.

b. Calyx glabrous or minutely puberulent: leaves narrowly ovate-triangular, 1 to 1.75 cm. long.

87. *S. FORRERI*, Greene, *Pittonia*, i. 156. — DURANGO, Sierra Madre, west of Durango, alt. 2,500 m., Sept., Oct., 1881 (*A. Forrer*).

= = Upper lip of calyx entire, subulate-tipped; calyx densely white-pubescent with long fine viscid spreading hairs.

88. *S. prunifolia*. Stems puberulent, decumbent, assurgent only at the tips, 3 to 5 dm. long: leaves orbicular to obovate, rounded or acutish at tip, round or cuneate at base, crenate-serrate, the uppermost largest, 3 to 5 cm. long, 2.5 to 3.5 cm. broad, the lowest much smaller, dull green,



minutely puberulent above and on the nerves beneath, on puberulent petioles 0.2 to 1 cm. long: peduncles 7 to 10 cm. long, pubescent above with long fine spreading hairs; verticels 4-8-flowered, all becoming remote, the lowest 1.5 to 2 cm. apart: bracts narrow-ovate, acuminate: pedicels 2 to 3 mm. long: calyx in anthesis 5 to 6 mm. long, the tube twice exceeding the subulate-tipped lobes: corolla 1.3 to 1.5 cm. long, the glabrous tube one half exceeding the calyx; galea puberulent, half as long as the dark blue lip. — TEPIC, Santa Gertrudis, in the Sierra Madre, Aug. 8, 1897 (*J. N. Rose*, no. 3407).

*D. Axilliflorae*, Benth. Small much branched and depressed suffrutescent plants: the flowers borne in the axils of foliar leaves: corolla-tube scarcely ventricose.

- \* Leaves oblong-linear oblanceolate or spatulate, 0.5 to 1.5 cm. long, entire, canescently rough-hispid.

89. *S. AXILLARIS*, Moc. & Sess. in Benth. Lab. 270; Benth. in DC. l. c. 313; Hemsl. l. c. 553; Briq. l. c. — South central Mexico. Without locality (*Coulter*, no. 1118): SAN LUIS POTOSI, in the mountains, 1876 (*Schaffner*, no. 648), alt. 1,850 to 2,500 m., 1878 (*Parry & Palmer*, no. 698): GUANAJUATO, 1893 (*A. Dugès*, no. 228 A).

- \* \* Leaves cuneate-obovate, 5 to 7.5 mm. long, 3-toothed, appressed-setulose.

90. *S. CUNEIFOLIA*, Benth. Lab. 270, & in DC. l. c.; Hemsl., l. c. 555; Briq. l. c. — Southern Mexico. HIDALGO, bare hills above Pachuca, alt. 2,600 m., July 18, 1898 (*C. G. Pringle*, no. 6905). Originally described from Oaxaca.

*E. Candicantes*, Benth. Shrubs: leaves oblong or lanceolate, rarely cordate, or when ovate not cordate, beneath tomentose or densely fine canescent, rarely pale and glabrate. (Some species approaching the *Scorodoniae*, others the *Erianthae*.)

- \* Calyx canescent short-pubescent or tomentose, not densely woolly.

+ Leaves entire or essentially so. (Reduced forms of *S. chamaedryoides* may be looked for here.)

- + Leaves sessile or subsessile, narrow-oblong, strongly revolute.

91. *S. Coulteri*. Branches ligneous, covered with gray-brown bark and numerous approximate leaf-scars: leaves densely cinereous-tomentulose with stellate hairs, strongly revolute, blunt at tip, truncate or subcordate at base, 1 to 1.5 cm. long, 2 to 4 mm. wide: racemes 2 to 3 cm. long; the rhachis pilose with long branching hairs; verticels about 6-flowered, slightly remote: calyx tubular-campanulate, glandular-pilose,

in anthesis 6 to 7 mm. long; the tube twice or thrice exceeding the lance-subulate teeth; upper lip tridentate: corolla 1.2 cm. long, short-pilose, the galea about equalling the lip: style slightly bearded. — Mexico, without locality (*Coulter*, no. 1120).

→ → Leaves narrowly triangular-ovate, truncate or slightly cordate at base, on thickish winged petioles, closely and densely white-pubescent beneath.

92. *S. CANDICANS*, Mart. & Gal. l. c. 61; Benth. l. c. 315; Hemsl. l. c. 554; Briq. l. c. — PUEBLA, limestone hills between Tehuacan and Esperanza, alt. 2,000 m., Dec. 21, 1895 (*C. G. Pringle*, no. 6245). Essentially the type station of the species.

→ → → Leaves narrow-ovate or oblong, attenuate at base to short petioles, or the upper subsessile.

= Calyx ovate tubular, with short blunt lobes, glandular-pubescent, in anthesis 5 to 6 mm. long: leaves closely white-pubescent beneath.

93. *S. THYMOIDES*, Benth. Lab. 255, & in DC. l. c. 314; Hemsl. l. c. 566; Briq. l. c. — Southern Mexico. PUEBLA, limestone hills between Tehuacan and Esperanza, alt. 2,000 m., Dec. 21, 1895 (*C. G. Pringle*, no. 6251): OAXACA, Mitla (*G. Andrieux*, no. 150); vicinity of Coixtlahuaca, alt. 2,150 to 2,300 m., Nov. 12, 1894 (*E. W. Nelson*, no. 1915). Species based in part on Andrieux's plant.

= = Calyx tubular-campanulate, with acuminate lobes, not glandular-pubescent, in anthesis 6 to 8 mm. long: leaves sparingly stellate puberulent or glabrate.

a. Leaves oblong, 1 to 2.5 cm. long, the uppermost subsessile.

1. Leaves finely stellate-puberulent at least when young.

94. *S. coahuilensis*. Freely branching mostly from the stout woody base; branches assurgent, 0.5 to 7 dm. high; bark pale brown, finely stellate-puberulent or glabrate: leaves confined mostly to the lower portions of the branches: racemes elongated, becoming 0.5 to 3.5 dm. long, the rhachis often glandular-puberulent; verticels mostly 2-flowered, all remote, the lowest 2 to 3 cm. apart: bracts ovate-oblong, acuminate, caducous: pedicels filiform, 2 to 4 mm. long: calyx granulose-puberulent; tube twice exceeding the ovate-lanceolate subequal lobes; upper lip entire: corolla 1.5 cm. long, blue with white centre; the glabrous tube nearly twice exceeding the calyx; the slightly pilose galea one half as long as the broad lower lip. — *S. chamaedryoides*, Wats., Proc. Am. Acad. xviii. 137, in part, not Cav. — COAHUILA, rocky hill, Saltillo, 1878 (*Parry*, no. 29), May, 1898 (*Edw. Palmer*, no. 194); Parras, June, 1880, and Lerios, July, 1880 (*Edw. Palmer*, nos. 1072, 1064).

## 2. Leaves glabrous.

95. *S. LYCIOIDES*, Gray, Proc. Am. Acad. xxi. 408. — CHIHUAHUA, cañons, Santa Eulalia Mts., May 1, 1885 (*C. G. Pringle*, no. 52).

b. Leaves ovate or ovate-oblong, 3 to 7 mm. long, all slender petioled.

96. *S. serpyllifolia*. Erect (?), 5 or 6 dm. high, the ascending branches brown, short-pubescent in decussating bands with minute white spreading or slightly recurved hairs; leafy to the inflorescence, the internodes 1 to 1.5 cm. long; racemes becoming 1 to 2 dm. long; verticels 2-6-flowered, all becoming remote, the lowest 1 cm. or so apart: bracts ovate, acuminate, ciliate, caducous: calyx short-hispidulous on the veins; tube thrice exceeding the ovate lobes; upper lip blunt, entire, lower with 2 short acuminate lobes: corolla 1.2 cm. long; the glabrous tube one-half longer than the calyx; the lower lip slightly exceeding the pilose galea: style slightly bearded. — *S. chamaedryoides*, Wats. Proc. Am. Acad. xviii. 137, in part, not Cav. — SAN LUIS POTOSI, without locality, alt. 1,850 to 2,460 m., 1878 (*Parry & Palmer*, no. 751).

+ + Leaves crenate or crenate-serrate. (A form of *S. scorodoniaefolia* may be looked for here.)

+ + Calyx lobes normal, not conspicuously broadened.

= Stems chalky-white with very close hirsute indumentum: leaves ovate, thin, slender-petioled, minutely white stellate beneath: verticels 6-10-flowered: calyx stellate-tomentulose; the tube thrice exceeding the short ovate lobes; the upper lip blunt, erect.

97. *S. CEDROSENSIS*, Greene, Bull. Cal. Acad. i. 212. — LOWER CALIFORNIA, Cedros Island, March, 1889 (*Edw. Palmer*, no. 684), March to June, 1897 (*A. W. Anthony*, no. 294); Magdalena Bay, Jan. 14, 1889 (*T. S. Brandegee*).

= = Stems and leaves (at least beneath) more or less cinereous-tomentulose with stellate hairs: verticels 2-6-flowered: calyx-tube twice exceeding the acuminate lobes.

98. *S. CHAMAEDRYOIDES*. Cav.<sup>1</sup> Leaves elliptic-ovate or narrowly deltoid-ovate, green above, slender-petioled, 1 to 2.5 cm. long. — Ic. ii. 77, t. 197; Sims, Bot. Mag. t. 808; Benth. l. c. 314; Hemsl. l. c. 554; Briq. l. c. *S. chamaedrifolia*, Andr. Bot. Rep. vi. t. 416. *S. Chamaedrys*,

<sup>1</sup> *S. ramosissima*. Similar to *S. chamaedryoides*, very freely branching above: young branches slightly canescent with short spreading or somewhat recurved hairs: leaves paler beneath than above, more or less scabrous on both faces with short stiff simple hairs: calyx with similar pubescence on the nerves. — *S. chamaedryoides*, Gray, Syn. Fl. l. c. 371, not Cav. — Cañons of the Rio Grande, S.W. TEXAS, 1849 (*C. Wright*, no. 472 a): Organ Mts., NEW MEXICO, 1881 (*G. R. Vasey*).

Willd. Hort. Berol. i. 29, t. 29. — Central Mexico. ZACATECAS, plains, La Honda Station, Aug. 18, 1890 (*C. G. Pringle*, no. 3170): SAN LUIS POTOSI, alt. 1,850 to 2,460 m., 1878 (*Parry & Palmer*, no. 753): HIDALGO, bare hills above Pachuca, alt. 2,600 ft., July 18, 1898 (*C. G. Pringle*, no. 6907): MEXICO, mountains near Mexico and Guadalupe, Aug. 24, 1865 (*Bourgeau*, no. 855).

Var. *isochroma*. Leaves reduced, 0.5 to 1.5 cm. long, short-petioled or subsessile, mostly crowded, canescent on both faces. — SAN LUIS POTOSI, in the mountains, San Rafael and San Miguelito, 1876 (*Schaffner*, nos. 663, 664); without locality, alt. 1,850 to 2,460 m., 1878 (*Parry & Palmer*, nos. 750, 751½).

=== Stems with spreading pubescence: leaves 2 to 3 cm. long; blades little exceeding the petioles.

99. *S. PAUCIFLORA*, HBK. l. c. 303; Benth. l. c. 315; Hemsl. l. c. 563. — A doubtful species from "New Spain."

=== Of this section but not identified.

*S. SPICATA*, R. & S. Syst. Mant. i. 202 (*S. pulchella*, HBK. l. c. 288, t. 140, not DC. *S. pomifera*, Sessé & Moc. l. c. 7, ex. char., not L.) and *S. BREVIFLORA*, Moc. & Sessé in Benth. Lab. 274, species described from "New Spain" are placed by Bentham in this section. *S. spicata*, Gray, Syn. Fl. l. c. 461, is very different from the plate of *S. pulchella*, HBK.

↔ ↔ Calyx funnelform, the lobes becoming ampliate.

= Leaves ovate or ovate-orbicular, dark green above, much paler beneath, regularly crenate.

100. *S. BALLOTAEFLORA*, Benth. Leaves rugose, densely white-tomentulose beneath, 0.5 to 3 cm. long, rarely larger: racemes 0.5 to 8 cm. long. — Lab. 270, & in DC. l. c. 313; Torr. Bot. Mex. Bound. 131; Gray, l. c.; Hemsl. l. c. 553; Briq. l. c. *S. laxa*, Benth. l. c. — Texas to San Luis Potosi. Mexico, without locality (*Gregg*, no. 322): COAHUILA, Monclova, Aug., 1880, Parras, June, 1880, Lerios, July, 1880, Saltillo, May, 1898 (*Edw. Palmer*, nos. 1069, 1067, 1068, 107): TAMAULIPAS, 1843 (*Berlandier*, no. 3186): SAN LUIS POTOSI, San Rafael, 1876, (*Schaffner*, no. 670); near Matehuala, June 18, 1898 (*E. W. Nelson*, no. 4527).

Var. *Eulaliae*. Leaves large, 3 cm. long, broad-ovate, rugose, very slightly pubescent and hardly canescent beneath: racemes very numerous, 4 to 9 cm. long. — CHIHUAHUA, Santa Eulalia Mts., Sept. 1, 1885 (*C. G. Pringle*, no. 659).

Var. *pinguifolia*. Leaves large, as in the last, scarcely rugose, very pale beneath with a close very minute indumentum, not tomentulose, greasy to the touch: racemes all many-flowered. — NEW MEXICO, 1851-52 (*C. Wright*, no. 1524): ARIZONA, San Francisco Mts., back of Clifton, Sept. 3, 1880 (*E. L. Greene*, no. 300).

= = Leaves very pale on both surfaces, thick, hardly rugose, greasy to the touch, irregularly crenate.

101. *S. PLATYCHEILA*, Gray, Proc. Am. Acad. viii. 292, & Syn. Fl. l. c. — LOWER CALIFORNIA, Carmen Island, 1870, Nov. 1890 (*Edw. Palmer*, nos. 7, 878).

\* \* Calyx densely woolly: verticels in short spiciform racemes: lip of corolla distinctly exceeding the galea (otherwise approaching the *Erianthae*).

102. *S. confinis*. Branches canescent with fine stellate pubescence, leafy to the inflorescence: leaves oblong, blunt or acutish, rounded-truncate or subcuneate at base, very short-petioled, thick and rugulose especially along the closely crenulate margin, closely canescent on both surfaces, or ferruginous-tinged beneath, 1.5 to 4.5 cm. long, 0.5 to 2 cm. wide: spiciform racemes simple or slightly paniculate, 1 to 4 cm. long, lowest verticels slightly remote: bracts large, broad-ovate, acuminate, somewhat persistent, 0.5 to 1 cm. long, stellate-tomentose: calyx dark blue, mostly hidden by dense white-lanate pubescence: corolla blue, scarcely 1 cm. long. — *S. spicata*, Gray, l. c. 461, not R. & S. — Southern Arizona and adjacent Mexico. ARIZONA, mountain pass near Fort Huachuca, 1882 (*Lemmon*, no. 2861): SONORA, Fronteras, alt. 1,400 m., Sept. 25, 1890 (*C. V. Hartman*, no. 43).

*F. Scorodoniae*, Benth. Shrubs with ovate (in *S. thyrsiflora* ovate-lanceolate) rugose leaves generally cordate, rarely cuneate, at base.

\* Leaves white-tomentose beneath with simple hairs.

+ Leaves very rough-rugose above, mostly broad-ovate (except in variety of the first species) with obtuse or blunt tips.

++ Pedicels very short, at most 3 mm. long: racemes rather dense, often branching: calyx somewhat cuneate-campanulate, in anthesis 4 to 5 mm. long, with short flaring obtuse lobes.

= Pubescence of calyx glandular-villous.

103. *S. SCORODONIAEFOLIA*, Poir. Leaves ovate, subcordate. — Suppl. v. 46: Benth. l. c. 316; Hemsl. l. c. 565; Briq. l. c. *S. melissodora*, Lag. Gen. & Spec. Nov. 2. *S. hirta*, Schranck, Syll. Pl. Soc. Ratisb. ii. 60? according to Benth. *S. scorodonia*, Benth. Lab. 264. — Central and southern Mexico. SAN LUIS POTOSI, alt. 1,850



to 2,460 m., 1878 (*Parry & Palmer*, no. 730): MEXICO, Guadalupe June 21, 1865 (*Bourgeau*, no. 295): OAXACA, Valley of Cuicatlan, alt. 2,000 to 2,460 m., Nov. 10, 1894 (*E. W. Nelson*, no. 1898); San Juan del Estado, alt. 1,800 m., Oct. 20, 1895 (*L. C. Smith*, no. 930); Pápalo, Cuicatlan, alt. 1,650 m., Dec. 9, 1895 (*V. González*, no. 42).

Var. *crenaea*. Leaves narrower, oblong-lanceolate, blunt, rounded or subcuneate at base. — *S. scorodonia*, Benth. Pl. Hartw. 20, not Benth. Lab. 264. — A northern narrow-leaved extreme. AGUAS CALIENTES (*Hartweg*, no. 164): CHIHUAHUA, southwestern section, without locality, 1885 (*Edw. Palmer*).

= = Pubescence of calyx long-villous, not glandular.

104. *S. LASIANTHA*, Benth. Lab. 276, & in DC. l. c. 321; Hemsl. l. c. 559; Briq. l. c. — Range of the last from which it differs only in the more villous glandless calyx. Perhaps only a variety of that. DURANGO, Ramos to Inde, Aug., 1898 (*E. W. Nelson*, no. 4679): SAN LUIS POTOSI, in the mountains, San Rafael, 1876 (*Schaffner*, no. 671); without locality, alt. 1,850 to 2,460 m., 1878 (*Parry & Palmer*, no. 731); limestone ledges, San José Pass, July 23, 1890, and limestone hills, Las Canoas, Oct. 8, 1890 (*C. G. Pringle*, nos. 3206, 3273): HIDALGO, calcareous hills near Tula, alt. 2,160 m., Oct. 5, 1896 (*C. G. Pringle*, no. 6538): OAXACA, near Dominguillo, alt. 2,000 m., Oct. 3, 1894 (*E. W. Nelson*, no. 1595). Placed by Bentham and by Briquet in the section *Erianthae*.

-- -- Pedicels longer, 3 to 9 mm. long: racemes loosely flowered; verticels remote: calyx tubular-campanulate, in anthesis 6 mm. or more long.

= Calyx purplish-violet, glandular-villous, in anthesis nearly 1 cm. long: lower lip of corolla almost black; tube and galea pale.

105. *S. SEMIATRATA*, Zucc. Abhandl. Baier. Akad. Wiss. i. 298; Benth. in DC. l. c. 316; Hemsl. l. c. 565; Briq. l. c. — OAXACA, without locality, June (*Andrieux*, no. 149); calcareous hills, Las Sedas, alt. 1,850 m., Aug. 2, 1894 (*C. G. Pringle*, no. 4763), alt. 2,150 m., June 27, 1895 (*L. C. Smith*, no. 413); near city of Oaxaca, alt. 1,600 to 2,100 m., Oct. 2, 1894 (*E. W. Nelson*, no. 1511).

= = Calyx green (or blue-tinged), glandular-puberulent and minutely hispidulous on the nerves, in anthesis about 6 mm. long: corolla blue.

106. *S. Gonzalezii*. Branches very slender, somewhat villous, the youngest parts and the rhachises glandular-puberulent: leaves broad-ovate, bluntish at tip, truncate or subcordate at base, green and very rugose, slightly pubescent above, white-villous beneath, crenulate, 1 to



2.5 cm. long, 0.75 to 1.75 cm. broad, on villous petioles 1 cm. or less in length: racemes simple, 0.5 to 1.5 cm. long; verticels 3-8-flowered, all remote, the lowest 2 to 2.5 cm. apart: pedicels 3 to 5 mm. long, glandular-puberulent: calyx tubular-campanulate; the tube twice or thrice exceeding the ovate mucronate lobes; upper lip entire: corolla deep blue, 1.5 cm. long; the glabrate tube twice exceeding the calyx; the pilose galea slightly exceeding the dark lip: style bearded. — OAXACA, El Parián-Etla, alt. 370 m., Nov., 1898 (*V. González & C. Conzatti*, no 903).

← ← Leaves less rugose, narrow-ovate, mostly acuminate at tip.

← Flowers in small cymes forming a terminal thyrsus: leaves ovate-lanceolate.

107. *S. THYRSIFLORA*, Benth. Bot. Sulph. 151, & in DC. l. c.; Hemsl. l. c. 566; Briq. l. c. — Southwestern Mexico, Tepic to Michoacan. JALISCO, vicinity of Mascota and San Sebastian, alt. 1170 to 1540 m., March, 1897 (*E. W. Nelson*, nos. 4057, 4081): MICHOACAN, mountains near Patzcuaro, Nov. 10, 1890, Dec. 21, 1891 (*C. G. Pringle*, nos. 3593, 4097). Originally from TEPIC.

↔ ↔ Flowers in simple or more or less branched generally paniculately or virgately disposed racemes.

= Branches short-pilose with recurved spreading hairs.

a. Calyx tubular, in fruit 5 mm. long, the tube four times exceeding the very short broad lobes.

108. *S. ALAMOSANA*, Rose, Contrib. U. S. Nat. Herb. i. 110. — SONORA, Sierra de los Alamos, 1890 (*Edw. Palmer*, no. 345).

b. Calyx campanulate, in fruit 6 to 7 mm. long, the tube twice exceeding the narrower lobes.

109. *S. CHAPALENSIS*, Briq. Ann. Conserv. Jard. Bot. Genève, ii. 145. — JALISCO, rich wooded cañons, mountains near Lake Chapala, Nov. 22, 1892 (*C. G. Pringle*, no. 4351).

= = Branches pubescent with ascending soft hairs.

110. *S. multiramea*. Stems about 1 m. high, freely paniculate-branched, the upper branches leafless and bearing racemes: leaves narrow-ovate, acuminate, rounded or subcordate at base, somewhat rugose and scabrous-hispidulous above, densely tomentose beneath, short-petioled, 2 to 5 cm. long, 1 to 2.5 cm. broad: inflorescence paniculate; lower branches leafy and axillary, upper naked; terminal racemes 1.2 dm. or less in length, the others shorter; verticels 2-12-flowered, all becoming remote: bracts lance-subulate, minute, early deciduous: pedicels 2 to

4 mm. long, spreading: calyx tubular, in anthesis 3.5 to 4 mm. long, appressed-pilose; the tube 3 or 4 times as long as the short blunt lobes: corolla blue, 1 to 1.2 cm. long; the glabrous tube one half longer than the calyx; the pilose galea twice exceeded by the exteriorly pilose lip: style bearded. — Southern Mexico. OAXACA, near city of Oaxaca, alt. 2,300 to 2,920 m., Sept., 1894 (*E. W. Nelson*, no. 1448), alt. 1,850 m., Oct. 25, 1894 (*C. G. Pringle*, no. 6013); near Reyes, alt. 1,700 to 2,060 m., Oct. 20, 1894 (*E. W. Nelson*, no. 1783); mountains of Jayacatlan, alt. 1,300 m., Nov. 4, 1894, alt. 2,000 m., Oct. 18, 1895 (*L. C. Smith*, nos. 272, 860); near Chilpancingo, alt. 2,770 to 3,140 m., Dec. 24, 1894 (*E. W. Nelson*, no. 2235): CHIAPAS, without locality (*Giesbreght*, no. 764).

\* \* Leaves, at least when young, pale beneath with stellate hairs.

+ Calyx densely invested with close stellate indumentum, not long woolly (except at the base in no. 114).

↔ Leaves 1 to 1.5 cm. long.

111. *S. FRUTICULOSA*, Benth. Lab. 721, & in DC. l. c. 315; Hemsl. l. c. 556; Briq. in Engl. & Prantl, l. c. — OAXACA, near city of Oaxaca (*Andrieux*, no. 151).

↔ ↔ Leaves 2 to 6 cm. long.

= Branchlets and nerves of young leaves with sulphur-yellow indumentum.

112. *S. Conzattii*. Branching above, the younger parts densely stellate-tomentulose: leaves ovate, 1.5 to 6 cm. long, 0.75 to 3.5 cm. broad, rounded at tip, rounded-truncate or subcuneate at base, dark green and very rugose above, pale and very strongly reticulate-rugose beneath; margin finely crenulate; petioles 1.5 cm. or less in length: racemes spiciform, 2 to 6 cm. long, at first dense, the 3-many-flowered verticels later becoming a little remote, all the parts more or less red-punctate: bracts ovate-acuminate, exceeding the calyx, white-tomentose at base, yellowish at tip, soon deciduous: calyx ovate-campanulate, densely tomentose with pale blue freely-branching hairs, with very short blunt inconspicuous lobes: corolla 1.2 cm. long, blue, red-punctate and whitened above with stellate tomentum; tube somewhat exserted; the galea hardly equalling the lip: style bearded. — OAXACA, El Parián-Ecla, alt. 370 m., Nov. 1898 (*V. González & C. Conzatti*, no. 902).

= = Branchlets and lower faces of leaves with white indumentum.

a. Leaves broad-ovate, sharply crenate-dentate: calyx-lobes blunt.

113. *S. pruinosa*. Rather stout shrub with pale brown bark, the younger parts densely pruinose with stellate hairs: leaves 2.5 to 5 cm.

long, 1.5 to 3.5 cm. wide, blunt at tip, rounded or subcuneate at base, green very rugose and glabrate above, very white beneath, irregularly crenate-dentate; petioles 1.25 cm. or less in length: racemes 1 dm. or less long; verticels many-flowered, rather crowded, the lowest 1 to 1.5 cm. apart; all the parts red-punctate; rhachis pruinose-pubescent: bracts ovate-acuminate, bluish, finely stellate-pubescent: calyx ovate-campanulate, closely pruinose-pubescent, bluish-tinged, in anthesis 4 to 5 mm. long; the tube twice or thrice exceeding the deltoid blunt lobes: corolla 1.2 cm. long, pruinose-stellate; the tube one half longer than the calyx; the galea about equalling the lip: style bearded. — JALISCO, road between Mesquitec and Monte Escobedo, Aug. 26, 1897 (*J. N. Rose*, no. 2601).

b. Leaves oblong-ovate, bluntly crenate: calyx-teeth subulate.

114. *S. Goldmanii*. Stem stout, 6 or 7 dm. high, herbaceous, or fruticose at base, puberulent, with numerous ascending branches above: leaves dull-green, slightly rugose above, cinereous and red-punctate beneath, 1 dm. or less long, bluntish at tip, rounded-cuneate to petioles 2 cm. or less in length: racemes 0.5 to 1.5 dm. long; verticels 6–12-flowered, the lower 2 cm. apart, the upper approximate; rhachis lanate: bracts lance-ovate, caducous: calyx in anthesis 5 to 6 mm. long, lanate at base, the deltoid subulate-tipped lobes one half as long as the tube: corolla red-punctate, 1.5 cm. long; the tube somewhat exserted, glabrous below; the lips stellate-pilose without, the lower exceeding the galea: style barely exserted, bearded. — Northwestern Mexico. CHIHUAHUA, near Batopilas, alt. 1690 to 2000 m., Oct. 4, 5, 1898 (*E. A. Goldman*, no. 214).

— — Calyx blue, invested in long white wool: leaves becoming glabrate, conspicuously red-punctate beneath.

115. *S. RUBROPUNCTATA*, Robinson & Fernald, Proc. Am. Acad. xxx. 121. — SONORA, in the cañon, Huehuerachi, Dec. 12, 1890 (*F. E. Lloyd*, no. 451).

\* \* \* Leaves glabrous, or the youngest slightly puberulent on the nerves beneath.

116. *S. Nelsonii*. Shrub with smooth reddish-brown bark, the younger branchlets slightly puberulent: leaves ovate, blunt or acutish at tip, rounded at base, 1.5 to 5 cm. long, 1 to 3 cm. broad, dull green and obscurely rugose above, paler beneath, crenate-serrate: petioles slender, puberulent, 1 cm. or less in length: inflorescence more or less paniculate; the racemes 1 dm. or less long, the upper terminating leafless branches; verticels 6–12-flowered, becoming a little remote, the lowest 1 to 2 cm.

apart: calyx cuneate-campanulate, resembling that of *S. scorodoniaefolia*, densely short white-villous, in anthesis 5 to 6 mm. long; the tube three or four times exceeding the short blunt lips: corolla blue, pilose, 1.2 cm. long; the tube included or barely exerted; the lip slightly exceeding the galea: style bearded. — PUEBLA, between Acatlan and Piaxtla, alt. 1,230 to 1,380 m., Nov. 22, 1894 (*E. W. Nelson*, no. 2005). The calyx has a strong ginger-like fragrance.

\* \* \* \* Leaves pubescent beneath: plant not identified.

117. *S. KEERLIH*, Benth. Lab. 263, & in DC. l. c. 316, with ovate cordate very rugose leaves canescent-tomentose beneath, and with dense paniculate-branched racemes, the calyx pilose-hirsute, not canescent-tomentose, described from Tlalpujahua, MICHOACAN, and from Regla.

*G. Cordifoliae*, Benth. Tall herbs or shrubs (ours herbs) with broad cordiform herbaceous leaves green or pale beneath and cordate at base, at least the lowermost long-petioled. (*S. purpurascens* & *S. Martensii* might be looked for here.)

\* Stems pilose-hispid: leaves crenate, pale beneath: calyx pilose-hispid, more or less glandular.

118. *S. AMARISSIMA*, Ort. Dec. 4; Edw. Bot. Reg. iv. t. 347; Benth. l. c. 317; Hemsl. l. c. 553; Briq. l. c. 280. *S. circinata*, Cav. Ic. iv. 9, t. 318. *S. amara*, Jacq. Hort. Schoenb., iii. 2, t. 255. *S. hirsuta*, Sessé & Moc. l. c. 8. *S. amethystina*, Donnell Smith, Enum. Pl. Guat. i. 35, ii. 62, in part, not Smith. — *S. cyanea*, Donnell Smith l. c. iii. 67, iv. 125, not Benth. — A common species from Central Mexico to Central America and Panama. Without locality (*Uhde*, no. 791): SAN LUIS POTOSI, alt. 1,850 to 2,460 m., 1878 (*Parry & Palmer*, no. 752): HIDALGO, hills above Pachuca, alt. 2,550 m., July 18, 1898 (*C. G. Pringle*, no. 6914): MEXICO, Guadalupe, Aug. 17, 1865 (*Bilimek*, no. 304); Valley of Mexico, May 11, 1865 (*Bourgeau*, no. 125, in part), Sept. 19, 1889 (*C. G. Pringle*, no. 2817); Rio Hondo Cañon, Aug. 22, 1890 (*C. G. Pringle*, no. 3153): MICHOACAN, Tlalpujahua (*Graham*): OAXACA, Monte Alban, alt. 1,790 m., July 20, 1894 (*L. C. Smith*, no. 171); Valley of Oaxaca, alt. 1,540 to 1,790 m., 1894 (*E. W. Nelson*, nos. 1103, 1289): GUATEMALA, Coban, Dept. Alta Verapaz, alt. 1,320 m., July, 1885, and Santa Rosa, Dept. Baja Verapaz, alt. 1,540 m., July, 1887 (*H. von Tuerckheim* in exsicc. *J. D. Smith*, nos. 110, 1192); San Lucas, Dept. Zacatepéquez, alt. 1,700 m., April, 1890 (*J. D. Smith*, no. 2187); Estanzuela, Dept. Santa Rosa, alt. 770 m., Aug., 1892, Santa Rosa, alt. 925 m., May, 1893, and Laguna de Ayarza, Dept. Ja-

lapa, alt. 2,460 m., Sept., 1892 (*Heyde & Lux* in exsicc. J. D. Smith, nos. 4050, 4564, 4056 : PANAMA, Gatun (*Sutton Hayes*).

\* \* Stems puberulent above and slightly short-pilose on the angles, densely woolly at the nodes: leaves crenate-serrate: calyx puberulent and minutely pilose.

119. *S. SIDAEOFOLIA*, Mart. & Gal. l. c. 67; Benth. l. c. 318; Hemsl. l. c. 565; Briq. l. c. — OAXACA, wet ravines, Sierra de San Felipe, alt. 2,600 m., Jan. 3, 1895 (*C. G. Pringle*, no. 5643). Originally collected in the cordillera of OAXACA.

*H. Rudes*, Benth. Herbs with ovate leaves cordate at base, subsessile or very short-petioled.

\* Bracts ovate-lanceolate, 1 to 1.5 cm. long, firm and persistent: calyx in anthesis 1 cm. long: corolla crimson, 3 cm. long: plant weak, pilose-hispid, the leaves firm and lucid.

120. *S. SESSILIFOLIA*, Gray in Wats. Proc. Am. Acad. xxii. 445; Briq. Ann. Conserv. Jard. Bot. Genève, ii. 152. — JALISCO, bottom of ravine, Rio Blanco, July, 1886 (*Edw. Palmer*, no. 184); ravines near Guadalajara, July 1, 1889 (*C. G. Pringle*, no. 3058). In its corolla approaching the *Fulgentes*.

\* \* Bracts minute, caducous.

— Stems simple or subsimple from woody base, more or less pilose: leaves green on both faces, blunt or obtuse: calyx in fruit 7 to 8 mm. long.

121. *S. PLATYPHYLLA*, Briq. l. c. 50. *S. amarissima*, Wats. l. c., not Ort. — JALISCO, hills, Rio Blanco, July, 1886 (*Edw. Palmer*, no. 183); hillsides near Guadalajara, July 3, 1889 (*C. G. Pringle*, no. 2560).

— Stem freely branching above, pilose with somewhat recurved hairs: leaves canescent, pilose beneath, acuminate: fruiting calyx about 5 mm. long.

122. *S. NEPETOIDES*, HBK. l. c. 299, t. 150. *S. amarissima*, Benth. l. c. 317, as syn.; Hemsl. l. c. 553, as syn.; not Ort. — South central Mexico. MORELOS, mountain side near Cuernavaca, alt. 2,160 m., Aug. 9, 1898 (*C. G. Pringle*, no. 7612). Originally from GUANAJUATO.

§ 4. *ERIANTHAE*, Benth. Shrubs generally with rugose leaves (not in *S. populifolia*). Calyx densely lanate. Lips of the corolla subequal or the galea longer; the tube a little exserted, straight, ventricose or enlarged above.

\* Pubescence of calyx purple or rose-colored.

— Leaves lanceolate or linear-lanceolate, green above, white-lanate beneath: raceme elongated, 4 dm. or less in length: corolla white, lanate.

123. *S. LEUCANTHA*, Cav. Ic. i. 16, t. 24; Hook. Bot. Mag. t. 4318; Benth. l. c. 321; Hemsl. l. c. 560; Briq. in Engl. & Prantl, l. c. S.



*bicolor*, Sessé & Moc. l. c. 8. — Coahuila to Oaxaca, often cultivated. Without locality (*Graham*): COAHUILA, garden at Saltillo, 1848-49 (*Gregg*, no. 597): ZACATECAS, in plaza, Monte Escobedo, Aug. 27, 1897, and on the Sierra de los Morones, near Plateado, Sept. 1, 1897 (*J. N. Rose*, nos. 2641, 3627): SAN LUIS POTOSI, near Santa Maria, 1876 (*Schaffner*, no. 669).

+ + Leaves ovate, subcordate: corolla reddish.

↔ Leaves very rugose, 2.5 to 4 cm. long, on short petioles 4 to 8 mm. long.

124. *S. LANTANAEFOLIA*, Mart. & Gal. l. c. 69; Benth. l. c. 322; Hemsl. l. c. 559; Briq. l. c. — PUEBLA, Atlitico, July 25-Aug. 1, 1893 (*E. W. Nelson*). Originally from PUEBLA. Seaton's no. 500 from Maltrata, VERA CRUZ, is near this species but not satisfactorily referable to it.

↔ ↔ Leaves hardly rugose, 0.5 to 1 dm. long, on petioles 1.5 to 2.5 cm. long.

125. *S. populifolia*. Shrub with gray bark: branchlets and petioles lanate with yellowish white pubescence: leaves ovate, bluntly acuminate, crenulate, green and puberulent above, white-velutinous beneath: raceme 1.5 dm. or less in length, simple or with a tendency to branch; verticels about 6-flowered, becoming a little remote: bracts ovate, acuminate, 1 cm. long, purple-lanate without, soon deciduous: calyx campanulate, in anthesis 1.8 cm. long, the tube twice or thrice exceeding the deltoid acuminate lobes; upper lip entire, lower 2-lobed: corolla pilose, reddish, 3.5 cm. long, the galea slightly exceeding the lip: long-exserted portion of style glabrous. — JALISCO, Bolaños, Sept., 1897 (*J. N. Rose*, no. 2862).

\* \* Pubescence of dorsal and ventral portions of calyx dark red, of the sides brilliant yellow: corolla dark red; the lip much shorter than the galea: leaves ovate-lanceolate, acuminate at base, very rugose above.

126. *S. PITTIERI*, Briq. Bull. Soc. Bot. Belg. xxx. pt. 1, 237. Described from COSTA RICA, and doubtfully referred by its author to this group.

55 § 5. *MACROSTACHYAE*, Benth. Pubescent large-leaved shrubs or herbs. Racemes dense, thick, with large thick firm leaf-like persistent bracts. Corolla blue or white, twice or thrice as long as the calyx.

\* Villous herb: leaves ovate, rounded or subcuneate to a winged petiole: verticels very many-flowered, somewhat remote.

127. *S. CLINOPODIODES*, HBK. l. c. 294, t. 145; Benth. l. c.; Hemsl. l. c. 554; Briq. l. c. *S. parquerensis*, Moc. & Sess. in Benth. Lab. 273;



Benth. in DC. l.c.; Hemsl. l.c. 562; Briq. l.c. *S. patzcuarensis*, Sess. & Moc. Pl. Nueva España, ed. 2, 8. — Sierra Madre of Western Mexico. CHIHUAHUA, 100 km. S. of Guadalupe y Calvo, alt. 2,300 to 2,600 m., Aug., 1898 (*E. W. Nelson*, no. 4807). MICHOACAN, sandy fields, hills of Patzcuaro, Oct. 11, 1892 (*C. G. Pringle*, no. 4258). Originally collected by Humboldt & Bonpland near Patzcuaro.

\* \* Canescent-puberulent shrub: the firm leaves pale beneath: corolla pale blue or whitish.

128. *S. SHANNONI*, Donnell Smith, Bot. Gaz. xix. 256. — Southern Mexico and Central America. CHIAPAS, top of ridge back of Tonala, alt. 370 to 770 m., Aug. 10, 1895 (*E. W. Nelson*, no. 2898): GUATEMALA, Volcan Chingo, Dept. Jutiapa, alt. 925 m., Oct., 1892 (*W. C. Shannon* in exsicc. J. D. Smith, no. 3612); Chupadero, Dept. Santa Rosa, alt. 1,540 m., Oct., 1892 (*Heyde & Lux* in exsicc. J. D. Smith no. 4052). The Chiapas plant has broader leaves and bracts than those from Guatemala, but they undoubtedly belong together.

§ 6. LONGIFLORAE, Benth. Corolla from 2 to 12 cm. long, of various colors. (See note under § *Brachyanthae*.)

*A. Luteae*, Benth. Shrubs with axillary or racemose flowers: corolla yellow, ventricose below the throat.

\* Flowers axillary, solitary: corolla 2 to 3 cm. long: leaves cordate-ovate, 2.5 cm. or less long, very rugose, canescent-tomentose beneath.

129. *S. ASPERA*, Mart. & Gal. l.c. 71; Benth. in DC. l.c. 327; Hemsl. l.c. 553; Briq. l.c. — Southern Mexico. PUEBLA, dry calcareous hills, Tehuacan, alt. 1,700 m. [the original station of Galeotti], Nov. 27, 1895 (*C. G. Pringle*, no. 6240): OAXACA, Jayacatlan, alt. 1,320 m., June 3, 1894, and Nov. 18, 1895 (*L. C. Smith*, nos. 17, 897); near Domingillo, alt. 2,000 m., Oct. 3, 1894 (*E. W. Nelson*, no. 1587).

\* \* Flowers racemose.

← Calyx invested with yellow or yellow and reddish tomentum: corolla yellow, red within, 2 to 3 cm. long: leaves rugose, canescent-tomentose beneath.

130. *S. CHRYSANTHA*, Mart. & Gal. l.c. 72; Benth. l.c. 326; Hemsl. l.c. 554; Briq. l.c. — Southern Mexico and Central America. GUERRERO, between Tlapa and Tlaliscatilla, alt. 1,200 to 1,380 m., Dec. 5, 1894 (*E. W. Nelson*, no. 2049); OAXACA, Monte Alban, alt. 1,850 m., Sept. 4, 1894 (*C. G. Pringle*, no. 4862), Oct. 11, 1895 (*L. C. Smith*, no. 950); Valley of Oaxaca, alt. 1,540 to 1,630 m., Sept. 25, 1894 (*E. W. Nelson*, no. 1244): CHIAPAS, without locality (*Ghiesbreght*, no.

765); between San Cristobal and Teopisca, alt. 2,060 to 2,600 m., Dec. 4, 1895, and between Hacienda Juncana and San Vincente, alt. 1,300 to 1,850 m., Dec. 12, 1895 (*E. W. Nelson*, nos. 3429, 3507).

+ + Calyx glandular-puberulent: corolla 3.5 to 4 cm. long: leaves cordate, acuminate, the lowest often 3 dm. long.

131. *S. MADRENSIS*, Seem. Bot. Herald, 327, t. 70; Hemsl. l. c. 560. — Described from the Sierra Madre of northwestern Mexico. Not seen.

*B. Inflatae*, Benth. Shrubs: calyx inflated-companulate, brightly colored: corolla scarlet; the tube subventricose. (Calyx and corolla by rare exception white.)

\* Leaves ovate-lanceolate to oblong, cuneate or narrowed at base.

+ Calyx and corolla glabrous or merely puberulent: style glabrous.

132. *S. SESSEL*, Benth. Lab. 288, & in DC. l. c. 332; Hemsl. l. c. 565; Briq. l. c. 282. *S. Roezli*, Scheidw. Fl. des Serres, xiv. 31, t. 1407. *S. semperflorens*, La Llave in La Nat. vii. Apénd. 81, ex char. *S. fastuosa*, Sessé & Moc. l. c. 7. *Rhodochlamys speciosa*, Schauer, Linnaea, xx. 707. — Southern Mexico. MORELOS, Cuernavaca, Nov. 14, 1865 (*Bourgeau*, no. 1238).

+ + Calyx and corolla glandular-pilose: style pilose.

133. *S. WAGNERIANA*, Polak. Linnaea, xli. 591. — Described from Costa Rica. Not seen.

\* \* Leaves ovate-lanceolate, cordate at base: stems viscid-hirsute.

134. *S. ADGLUTINANS*, Lag. Gen. & Spec. Nov. 2; Benth. l. c.; Hemsl. l. c. 552; Briq. l. c. — Described from "New Spain." Not seen.

\* \* \* Leaves ovate, acuminate, rounded at base, white-tomentose beneath, 1 dm. or less in length: branches tomentose: shrub or small tree (1 to 6 m. high).

135. *S. PUBESCENS*, Benth. Lab. 723, & in DC. l. c.; Hemsl. l. c. 563; Briq. l. c. — Southern Mexico. MORELOS, near Cuernavaca, Oct. 27, 1895, and Nov. 9, 1895, calyx and corolla white (*C. G. Pringle*, nos. 7080, 7065): OAXACA, San Dionicio (*Andrieux*, no. 143); Jayacatlan, alt. 1,380 m., Sept. 10, 1894 (*L. C. Smith*, no. 170); Monte Alban, alt. 1,790 m., Oct. 4, 1894 (*C. G. Pringle*, no. 4960); near Oaxaca, alt. 1,600 to 1,930 m., Oct. 2, 1894, near Huajuapam, alt. 1,470 to 2,000 m., Nov. 19, 1894, and near Tlapancingo, alt. 1,850 to 2,460 m., Dec. 7, 1894 (*E. W. Nelson*, nos. 1972, 1521, 2091).

\* \* \* \* Leaves deltoid-ovate to orbicular, coriaceous, pubescent on the nerves beneath, 4 cm. or less long: branches slender, purplish, glabrous or glabrate.

136. *S. REGLA*, Cav. Ic. v. 33, t. 455; Benth. Lab. 288, & in DC. l. c., 333; Lindl. Bot. Reg. xxvii. t. 14; Hemsl. l. c. 564; Briq. l. c. *S. deltoidea*, Pers. Syn. i. 28. *S. negla*, Pers. l. c. as syn. *S. crenata*, Mart. & Gal. l. c. 74; Benth. l. c. 348; Hemsl. l. c. 555; Briq. Ann. Conserv. Jard. Bot. Genève, ii. 157. — Central and southern Mexico. Without locality (*Coulter*, no. 1099, *Gregg*, no. 340): COAHUILA, Lerios, July, 1880 (*Edw. Palmer*, no. 1079); shaded gulches of limestone hills, Carneros Pass, Sept. 1, 1889 (*C. G. Pringle*, no. 2384): DURANGO, Santiago Papasquiario, 1896 (*Edw. Palmer*, no. 404), Aug. 7, 1898 (*E. W. Nelson*, no. 4663): SAN LUIS POTOSI, in woods, San Rafael, 1876 (*Schaffner*, no. 665); without locality, 1878 (*Parry & Palmer*, no. 741); San Luis Potosi, 1898 (*Edw. Palmer*, no. 726): AGUAS CALIENTES, by brooks (*Hartweg*, no. 165): GUANAJUATO, 1880 (*A. Dugès*): OAXACA, near Coixtlahuaca, alt. 2,150 to 2,300 m., Nov. 12, 1894 (*E. W. Nelson*, no. 1917).

*C. Fulgentes*, Benth. Shrubs, rarely herbs: calyx tubulose-campanulate: corolla scarlet or crimson; the tube straight, ventricose.

\* Freely branching shrubs (rarely herbs) with leaves 1 to 4 cm. long.

+ Flowers axillary.

137. *S. disjuncta*. Branches ferrugineous-pubescent: leaves cordate, ovate, blunt or acuminate, 4 cm. or less long, rugose, crenulate, dark green and hispid above, canescent and pilose beneath, on slender petioles: verticels mostly 2-flowered, in the axils: pedicels 6 mm. or less in length, usually twisted: calyx pilose on the nerves, in anthesis 1.2 to 1.5 cm. long; the tube twice exceeding the ovate acuminate lobes; upper lip entire: corolla 3 to 4 cm. long, minutely pilose, the ventricose tube twice exceeding the calyx; galea and lip subequal: style bearded. — CHIAPAS, among rocks, Aug., Sept. (*Ghiesbreght*, nos. 76, 753); near San Cristobal, alt. 2,150 to 2,460 m., Sept. 18, 1895 (*E. W. Nelson*, no. 3166). A unique species.

+ + Flowers in terminal racemes.

↔ Leaves ovate or broad oblong.

= Pubescence of branches and leaves simple.

a. Calyx hispidulous on the nerves.

1. Leaves glabrous or at least glabrate beneath.

138. *S. GRAHAMI*, Benth. Bot. Reg. xvi. t. 1370, & in DC. l. c. 335; Lodd. Bot. Cab. xviii. t. 1798; Ortgies, Gartenfl. vii. t. 242; Hemsl.

l. c. 557; Briq. in Engl. & Prantl l. c. *S. microphylla*, Gray, Proc. Am. Acad. xxi. 407, in part, not Benth. — Northern and central Mexico, not clearly separable from *S. microphylla*. CHIHUAHUA, 100 km. south of Guadalupe y Calvo, alt. 2,300 to 2,620 m., Aug., 1898 (*E. W. Nelson*, no. 4812<sup>a</sup>); Batopilas, alt. 1,690 to 2,000 m., Oct. 1898 (*E. A. Goldman*, no. 212): COAHUILA, hillside, Saltillo, May, 1898 (*Edw. Palmer*, no. 161): DURANGO, by stream, Durango, Nov. 1896 (*Edw. Palmer*, no. 844); near El Salto, July 12, 1898, and in the Sierra Madre, 25 km. north of Guanacevi, alt. 2,300 to 2,620 m., Aug. 17, 1898 (*E. W. Nelson*, nos. 4557, 4755): ZACATECAS, hills of Zacatecas, Oct. 26, 1888 (*C. G. Pringle*, no. 1764); in the Sierra Madre, Aug. 18, 1897, and near Plateado, Sept. 4, 1897 (*J. N. Rose*, nos. 2402, 2804): SAN LUIS POTOSI, in the mountains about San Luis Potosi, 1876 (*Schaffner*, no. 660), 1878 (*Parry & Palmer*, nos. 747, 748): VERA CRUZ, Mt. Orizaba, alt. 2,770 m., Aug. 8, 1891 (*Seaton*, no. 260): HIDALGO, Zimapan (*Coulter*, no. 1093): MEXICO, ledges and banks, Sierra de las Cruces, Oct. 23, 1892, and Serrania de Ajusco, alt. 2,770 m., May 23, 1898 (*C. G. Pringle*, nos. 4298, 7548).

2. Leaves pubescent beneath.

○ Shrubs.

+ Leaves mostly less than 2 cm. long.

139. *S. MICROPHYLLA*, HBK. l. c. 295. Leaves rounded at tip, slightly pubescent. — Benth. l. c.; Hemsl. l. c. 561; Gray, l. c., in part; Briq. l. c. — Central and southern Mexico. SAN LUIS POTOSI, San Miguelito, 1876 (*Schaffner*, no. 662); in market of San Luis Potosi, 1898 (*Edw. Palmer*, no. 640 $\frac{1}{2}$ ): MEXICO, Valley of Mexico (*Schaffner*, no. 394); Toluca, Sept. 17, 1898 (*E. W. D. Highway*, no. 3136): OAXACA, Tehuacan, alt. 615 m., June 24, 1896 (*C. Conzatti*, no. 163).

Var. *CANESCENS*, Gray, l. c. Leaves and branchlets densely canescent-pubescent. — CHIHUAHUA, in shade of cliffs, hills near Chihuahua, Oct. 17, 1885 (*C. G. Pringle*, no. 637): ZACATECAS, hills near Zacatecas. Mar. 17, 1885 (*C. G. Pringle*, no. 239), alt. 2,460 m. Dec. 8, 1898 (*C. C. Deam*, no. 139).

Var. *WISLIZENI*, Gray, l. c. 408. Puberulent: leaves narrowed to acutish tips. — CHIHUAHUA, Sierra Madre west of Chihuahua (*Wislizenus*, no. 152); north of Batopilas, 1885 (*Edw. Palmer*, no. 379).

++ Leaves larger.

× Leaves subsessile or short (3 mm.)-petioled.

140. *S. TRICOLOR*, Lemaire, Ill. Hort. iii. Misc. 71, t. 120, & Fl. des

Serres, xii. 109, t. 1237; Hemsl. l. c. iv. 81. — Introduced into cultivation from Mexico.

× × Leaves long-petioled.

†† Corolla 2.5 to 2.75 cm. long.

□ Leaves thin, hardly rugose, with subacuminate tips, pubescence rather sparse.

141. *S. LEMMONI*, Gray, Proc. Am. Acad. xx. 309, & Syn. Fl. l. c. 461; Hemsl. l. c. — Arizona and Chihuahua. CHIHUAHUA, Cañon de San Diego, Sept. 17, 1891 (*C. V. Hartman*, no. 738); foothills of Sierra Madre, near Colonia, Aug. 29, 1899 (*E. W. Nelson*, no. 6315).

□ □ Leaves rugose, mostly rounded at tips: pubescence more abundant.

142. *S. neurepia*. Freely branching shrub: branches puberulent, the younger parts pilose or densely villous: leaves ovate or round-ovate, truncate or subcordate at base, coarsely crenate, thick, rather densely short-pubescent on both faces, 2.25 to 2.75 cm. long, twice exceeding the slender petioles: racemes 1 dm. or less in length; verticels mostly 2-flowered, all becoming a little remote: bracts ovate, ciliate, caducous: calyx glandular-puberulent, a little hispidulous on the nerves, tubular-campanulate, in anthesis 1 to 1.3 cm. long; the tube twice exceeding the ovate-acuminate lobes: upper lip entire: corolla-tube pale, glabrous, twice exceeding the calyx; the pilose galea hardly equalling the red lip: style bearded. — Central Mexico. SAN LUIS POTOSI, in woods near Morales, 1876 (*Schaffner*, no. 661); without locality, alt. 1,850 to 2,460 m., 1878 (*Parry & Palmer*, no. 754); in the market of San Luis Potosi, 1898 (*Edw. Palmer*, no. 640). Graham's no. 1096 without locality apparently belongs here, and Bourgeau's no. 856 from near Guadalupe, MEXICO, though with larger thinner leaves, may be an extreme form. This species, as well as *S. microphylla*, is sold in the market of San Luis Potosi as a *Mirto*, decoction from them being used to allay fever, headaches, and nervous irritations.

†† †† Corolla 3.25 to 3.5 cm. long.

143. *S. Schaffneri*. Branches glandular-puberulent and slightly pilose: leaves thickish, rugose, deltoid-ovate, acuminate, rounded-truncate at base, puberulent on both faces, 2.5 to 4 cm. long, 1.5 to 3 cm. wide, irregularly crenulate, on slender petioles 1 to 2.5 cm. long: racemes becoming 1 to 1.5 dm. long; verticels mostly 4-flowered, all becoming remote, the lowest 2.5 cm. apart: bracts 5 mm. long, ovate, long-acuminate: pedicels 3 to 5 mm. long: calyx tubular-campanulate and minutely hispidulous, in anthesis, 1 to 1.2 cm. long; the tube twice



exceeding the lobes; upper lip oblong-ovate, entire, blunt, lower with two acuminate narrower lobes: corolla-tube glabrous, twice exceeding the calyx; galea slightly pilose at tip, shorter than the lip. — SAN LUIS POROSI, in the mountains near Morales, 1876 (*Schaffner*, no. 667), called "mirto grande." Habitally this plant suggests *S. fulgens*, var. *Boucheana*, Benth., but it is readily distinguished by its less pubescent leaves, shorter calyx and slightly pilose galea.

○ ○ Pubescent herb with ovate obtuse leaves canescent beneath.

144. *S. OBTUSA*, Mart. & Gal. l. c. 72; Benth. in DC. l. c. 334; Van Houtte, Fl. des Serres, xiv. t. 1412 (?); Hemsl. l. c. ii. 562. — Described from OAXACA. Various plants are cultivated under this name, but the figure above cited perhaps best represents the species.

b. Calyx glabrous or barely puberulent at base.

145. *S. oresbia*. Small shrub, 2 to 3 dm. high: branches purplish, puberulent in lines or glabrate: branchlets short, leafy mostly at the tip: leaves firm, ovate, acute at each end, appressed-serrate, glabrate, 1 to 2.5 cm. long: racemes 1 dm. or less in length; verticels 2-4-flowered: bracts firm, ovate, acuminate, 1 cm. or less long, persistent: pedicels 3 to 7 mm. long, puberulent: calyx purple-tinged, in anthesis 1 to 1.2 cm. long, puberulent within; the tube thrice exceeding the broad ovate mucronate-acuminate lobes: corolla 2 cm. long; the glabrous strongly ventricose tube one half longer than the calyx; the pilose galea hardly equalling the lip: style glabrous. — SAN LUIS POROSI, in the mountains, San Rafael, 1876 (*Schaffner*, no. 666); without locality, alt. 1,850 to 2,460 m., 1878 (*Parry & Palmer*, no. 740).

= = Pubescence of branches and leaves stellate.

146. *S. oaxacana*. Very branching shrub: the bark pale gray, the young branches and branchlets white with stellate tomentum: leaves ovate, truncate or cordate at base, 1 cm. or less in length, pale green and strongly rugose above, white-tomentose beneath, crenate, one-half longer than the tomentose petioles: racemes 6 cm. or less long; the verticels mostly 2-flowered, 1 to 1.5 cm. apart: bracts ovate-lanceolate, caducous: pedicels 3 to 6 mm. long, glandular-pilose: calyx open-campanulate, glandular-pilose, in anthesis 8 to 10 mm., in fruit becoming 1.3 to 1.5 cm. long: the upper lip broad-ovate, mucronate, somewhat bidentate, the lower lip with 2 ovate-lanceolate acuminate lobes: corolla somewhat glandular-pilose; the strongly ventricose tube twice exceeding the calyx; the galea and lip subequal: style bearded. — OAXACA, La Hoya Cañon,



alt. 1,380 m., Nov. 2, 1894 (*C. G. Pringle*, no. 5654). Resembling *S. aspera*, Mart. & Gal., from which it differs in its short terminal racemes of red flowers.

↔ ↔ Leaves from narrow oblong to linear-oblong.

147. *S. GREGGII*, Gray, Proc. Am. Acad. viii. 369, & Syn. Fl. l. c. 368; Hemsl. l. c. 557, & iv. 81; Hook. Bot. Mag. t. 6812. *S. microphylla*, Torr. Bot. Mex. Bound. 131, not HBK. — Texas to Durango. COAHUILA, cañon above Palomas, 1848-49 (*Gregg*, no. 335); high dry ridge, battlefield of Buena Vista (*Gregg*); Saltillo, 1878 (*Parry*, no. 26); Lerios, July, 1880, and near Saltillo, May, 1898 (*Edw. Palmer*, nos. 1071, 153): DURANGO, shady hillsides and river-banks, Santiago Papasquiaro, Aug., 1896 (*Edw. Palmer*, no. 417).

\*\* Branching or subsimple shrubs or half-shrubs or tall herbs, leafy nearly or quite to the inflorescence: leaves larger, only the smallest 4 cm. long.

+ Leaves pubescent beneath.

↔ Calyx-lobes with long setaceous-acuminate tips: corolla 2.5 to 4 cm. long: branches densely tomentose, viscid above.

= Leaves densely tomentose beneath, minutely so above.

148. *S. LINDENII*, Benth. in DC. l. c. 333; Hemsl. l. c. ii. 560; Briq. l. c. — Southern Mexico and adjacent Central America. OAXACA, between Pluma and San Miguel Suchistepec, alt. 2,460 to 3,070 m., March 21, 1895 (*E. W. Nelson*, no. 2508): CHIAPAS, without locality (*Ghiesbreght*, nos. 122, 755): GUATEMALA, Volcan de Agua, Dept. Zacatepéquez, alt. 2,770 m., Apr., 1890 (*J. D. Smith*, no. 2169).

= Leaves greener, thinly pubescent beneath, becoming glabrate above.

149. *S. RECTIFLORA*, Vis. Sem. Hort. Pat. 1839, ex ejusd. Ort. Bot. Pad. 145; Benth. l. c. 334; Hemsl. l. c. 564, excl. syn. — South-central Mexico. GUANAJUATO, rocky mountain-slopes, 1880, 1894 (*A. Dugès*).

↔ ↔ Calyx-lobes blunt or mucronate or merely short-acuminate.

= Corolla 4 to 6 cm. long.

a. Leaves densely white-tomentose beneath, finely crenate-serrate, and with sharp-acuminate tips: calyx glandular-puberulent.

150. *S. FULGENS*, Cav. Leaves cordate-ovate. — Ic. i. 15, t. 23; Sweet, Brit. Fl. Gard. ser. 2, i. t. 59; Lindl. Bot. Reg. xvi. t. 1356; Benth. l. c. 333; Hemsl. l. c. 556; Briq. l. c. *S. cardinalis*, HBK. l. c. 300, t. 152. *S. grandiflora*, Sessé & Moc. l. c. 7. — Central Mexico. ZACATECAS, on the Sierra de los Morones, near Plateado, Sept. 1, 1897 (*J. N. Rose*, no. 2743): JALISCO, between San Sebastian and the sum-

mit of Mt. Bufa de Mascota, alt. 2,150 to 2,300 m., March 20, 1897 (*E. W. Nelson*, no. 4093): MICHOACAN, Tlalpujahua (*Graham*): MEXICO, Toluca (*Andrieux*, no. 144); Désierto Viejo, Sept. 7, 1865, and San Nicolas, Oct. 26, 1865 (*Bourgeau*, nos. 853, 1106); Valley of Mexico (*Schaffner*, no. 396); cool forests, Sierra de las Cruces, alt. 3,230 m., Aug., 1892 (*C. G. Pringle*, no. 4227); Amecameca, Feb. 3, 1893 (*E. W. Nelson*, no. 6); foothills, Mt. Ixtaccihautl, Jan. 5, 1899 (*C. C. Deam*, no. 124): MORELOS, Serrania de Ajusco, alt. 2,460 m., May 26, 1898 (*C. G. Pringle*, no. 6862).

Var. *BOUCHEANA*, Benth. l. c. 334. Leaves narrowly deltoid-ovate, truncate or subcordate at base. — *S. Boucheana*, Kunth, Ind. Sem. Hort. Berol. 1845. — MICHOACAN, Tlalpujahua (*Graham*): PUEBLA, calcareous hills near Tehuacan, Aug. 30, 1897 (*C. G. Pringle*, no. 7449).

b. Leaves merely pilose on the nerves beneath, coarsely crenate, and with blunt tips: calyx not at all or very minutely glandular-puberulent.

151. *S. orizabensis*. Branches short-pilose with recurved hairs, minutely glandular above: leaves ovate, thin, minutely pilose above, 4 to 8 cm. long; the base subcordate with a short acumination at the junction with the slender retrorse-pilose petiole: raceme 1 dm. or so long; verticels 4–10-flowered, all remote, the lowest 4 to 5 cm. apart: bracts ovate-lanceolate, acuminate: pedicels 3 to 5 mm. long, sordid-viscid: calyx in anthesis 1.5 to 1.75 cm. long, slightly pilose on the nerves; the tube nearly twice exceeding the ovate bluntish lobes; upper lip entire: corolla-tube glabrate, twice exceeding the calyx; galea, long-bearded, equalling the lip: style somewhat bearded. — VERA CRUZ, Mt. Orizaba (*Botteri*, no. 1168).

= = Corolla 2.5 to 2.75 cm. long.

152. *S. adenophora*. Shrub ("sarmentose" according to Smith) with brown bark; the branches glandular-pilose: leaves cordate-ovate, acuminate (rarely blunt), crenate-serrate, green and sparingly pubescent above, more or less white tomentose beneath, 4 to 10 cm. long, on slender petioles 3 cm. or less in length: racemes 3 dm. or less in length; the rhachis very glandular-hairy; verticels 6–20-flowered, all remote, the lowest 2 to 3 cm. apart: bracts ovate, glandular, caducous: pedicels 6mm. or less in length, glandular: calyx campanulate, very glandular, in anthesis 8 to 10 mm. long, the tube twice exceeding the broad ovate mucronate or short-acuminate lobes; upper lip entire: corolla glandular-pilose, the tube once and a half longer than the calyx; galea and lip subequal: style bearded. — OAXACA, Jayacatlan, alt. 1,230 m., Sept. 11,

1894, and Nov. 17, 1895 (*L. C. Smith*, nos. 168, 875); between Tlapan-  
cingo and Tlalixtaquilla, GUERRO, alt. 1,600 to 1,230 m., Dec. 9, 1895  
(*E. W. Nelson*, no. 2093, in part); El Parián-Etla, alt. 1,200 m., Nov.,  
1898 (*V. González & C. Conzatti*, no. 900).

= = = Related to the above, but not identified, is

153. *S. LINEATA*, Benth. Lab. 724, with the branches pubescent in  
lines, obtuse leaves slightly pubescent, truncate at base, and with the  
flowers somewhat smaller than in *S. fulgens*, in 4-6-flowered verticels.

+ + Leaves glabrous beneath.

→ Calyx herbaceous; the tube becoming corrugated; the 3 acuminate lobes large  
and subequal, long-ciliate on the margins.

154. *S. PRINGLEI*, Robinson & Greenman, Proc. Am. Acad. xxix.  
391. — JALISCO, under cliffs, barranca of Tequila, Oct. 2, 1893 (*C. G.*  
*Pringle*, no. 4564).

→ → Calyx less herbaceous; the tube sub-inflated, not corrugated; the lobes  
unequal.

= Leaves cuneate at base.

155. *S. INVOLUCRATA*, Cav. Ic. ii. 3, t. 105; Lindl. Bot. Reg. xiv. t.  
1205; Bot. Mag. t. 2872; Benth. l. c. 333; Hemsl. l. c. 558, in part;  
Briq. l. c. *S. laevigata*, HBK. l. c. 295, t. 147. *S. Tonduzii*, Briq.  
Ann. Conserv. Jard. Bot. Genève, ii. 157. — Southern Mexico and Cen-  
tral America. GUATEMALA, Coban, Dept. Alta Verapaz, alt. 1,320 m.,  
Nov. 1886 (*H. von Tuerckheim* in exsicc. J. D. Smith, no. 345); Jumay-  
tepeque, Dept. Santa Rosa, alt. 1,850 m., Jan., 1893 (*Heyde & Lux* in  
exsicc. J. D. Smith, no. 4397).

= = Leaves cordate-ovate.

a. Calyx in anthesis 0.6 to 1 cm. long.

156. *S. PULCHELLA*, DC. Cat. Hort. Monsp. 142; Colla, Hort.  
Ripul. 125, t. 16; Benth. l. c. 334; Hemsl. l. c. 563; Briq. in Engl. &  
Prantl, l. c. — Southern Mexico and Central America. CHIAPAS, with-  
out locality (*Ghiesbreght*, nos. 71, 758); near San Cristobal, alt. 2,150 to  
2,460 m., Sept. 18, 1895, and between San Cristobal and Teopisca, alt.  
2,060 to 2,610 m., Dec. 4, 1895 (*E. W. Nelson*, nos. 3171, 3427):  
GUATEMALA, Purulá, Dept. Baja Verapaz, alt. 1,540 m., Apr. 1887  
(*H. von Tuerckheim* in exsicc. J. D. Smith, no. 1194).

b. Calyx in anthesis 1.5 to 2 cm. long.

157. *S. puberula*. Stem herbaceous, simple, 8 dm. high, from a  
woody base, minutely cinereous-puberulent: leaves 7 to 10 cm. long,

acuminate, appressed-serrate quite to the base, dull and minutely puberulous above, pale and glabrous beneath, on slender puberulent petioles 4.5 cm. or less in length: raceme simple, 1.3 dm. long; the rhachis and pedicels glandular and sparingly pilose; verticels 6-10-flowered, all remote, the lowest 2.5 cm. apart: bracts caducous (not seen): calyx tubular-campanulate, slightly pilose on the nerves; the lobes setaceous-acuminate, the upper lip twice exceeding the 2-lobed lower one, and twice exceeded by the tube: corolla 3 to 4 cm. long, the moderately ventricose glabrous tube twice as long as the calyx; the pilose galea equalling the lip: style bearded. — *S. involucreta*, Hemsl. l. c. 558, in part, not Cav. — SAN LUIS POTOSI, alt. 1,850 to 2,460 m., 1878 (*Parry & Palmer*, no. 755).

\* \* \* Stoloniferous herb; the subdeltoid or cordiform leaves confined chiefly to the lower half: peduncle elongated, simple; verticels 2-6-flowered, remote: corolla 5 cm. long.

158. *S. STOLONIFERA*, Benth. Pl. Hartw. 70, & in DC. l. c. 333; Hemsl. 565; Briq. l. c. — OAXACA, Sierra de San Felipe, alt. 2,300 to 3,080 m., June 23, 1894 (*C. G. Pringle*, no. 4705, *E. W. Nelson*, no. 1183); Telixtlahuaca, alt. 2,300 m., July 27, 1895 (*L. C. Smith*, no. 477).

*D. Cyaneae*, Benth. Calyx tubulose-campanulate: corolla blue violet or rose, straight; the tube ventricose.

\* Corolla rose or rose-purple.

+ Leaves hispid or pilose beneath.

↔ Leaves rounded-cuneate at base: corolla 1.5 to 1.8 cm. long.

159. *S. PURPURASCENS*, Mart. & Gal. l. c. 69; Benth. in DC. l. c. 335; Hemsl. l. c. 564; Briq. l. c. 283. — Described from Mt. Orizaba, VERA CRUZ. Not seen.

↔ ↔ Leaves cordate at base.

= Verticels 6-flowered: calyx 1.3 cm. long: corolla 3 cm. long.

160. *S. IODOCHROA*, Briq. Ann. Conserv. Jard. Bot. Genève, ii. 161. — Described from COSTA RICA. Not seen.

= Verticels 10-30-flowered: mature calyx 8 mm. long: corolla 1.5 cm. long.

161. *S. irazuensis*. Tall and freely branching, the stem purple, slightly crisp-pilose in lines, or glabrate; the branchlets glandular-pilose: internodes long (1 dm.): leaves cordate-ovate, acuminate, serrate, the

larger 5 to 6 cm. long, green and glabrate above, pale and appressed-pilose on the nerves beneath: racemes elongated, 3 to 4 dm. or less long; verticels all remote: pedicels becoming 6 to 8 mm. long, glandular-pilose: calyx puberulent, short pilose on the nerves; the upper lip ovate, short-acuminate, one half as long as the tube, the lower lip with 2 lance-ovate setaceous-acuminate lobes: corolla-tube once and a half longer than the calyx; the pilose galea shorter than the lip: style bearded. — *S. tiliaefolia*, Donnell Smith, l. c. v. 71, in part, not Vahl. — COSTA RICA, Volcan Irazu, Prov. Cartago, alt. 3,000 m., Mar., 1894 (*J. Donnell Smith*, no. 4920). Near the last species, but with much smaller flowers, in denser verticels.

+ + Leaves glabrous or merely puberulent beneath, rounded or subcordate at base: corolla 1.3 to 2.5 cm. long.

162. *S. MARTENSII*, Gal. Bull. Acad. Brux. l. c. 77; Benth. l. c.; Hemsl. l. c. 560; Briq. l. c., & in Engl. & Prantl, l. c. *S. membranacea*, var. *villosa*, Benth. Lab. 720. *S. villosula*, Benth. in DC. l. c.; Briq. Ann. Conserv. Jard. Bot. Genève, ii. 160. — Southern Mexico. OAXACA, Sierra de San Felipe, alt. 3,170 m., Aug. 8, 1894 (*C. G. Pringle*, no. 4772), alt. 2,920 to 3,380 m., 1894 (*E. W. Nelson*, no. 1100), alt. 3,000 m., Nov. 14, 1897 (*C. Conzatti* and *V. González*, no. 539): CHIAPAS, among the mountains (*Ghiesbreght*, no. 742). Ghiesbreght's plant with rounded, not subcordate leaf-bases and corolla only 1.3 cm. long, probably represents *S. villosula* which Briquet maintains at least as a subspecies.

\* \* Corolla blue or violet.

+ Leaves cuneate or narrowed at base.

→ Leaves lanceolate or oblong-lanceolate.

= Leaves oblong-lanceolate, acuminate, crenate-serrate, more or less pubescent beneath: corolla-tube and galea white; lip dark blue.

163. *S. ALBO-CAERULEA*, Linden, Belg. Hort. vii. 199, & Gart-enfl. vii. 55, 97, t. 221; Hemsl. l. c. iv. 80. — South-central Mexico. MORELOS, wet mountain cañon above Cuernavaca, alt. 2,000 m., May 15, 1898, Feb. 15, 1899 (*C. G. Pringle*, nos. 7615, 8020), distributed under an unpublished manuscript name. Originally from MICHOCAN.

= = Leaves elliptic-lanceolate, caudate-acuminate, sharply dentate-serrate, glabrous beneath: corolla violet-purple.

164. *S. PANSAMALENSIS*, Donnell Smith, Bot. Gaz. xxiii. 249. — GUATEMALA, Pansamalá, Dept. Alta Verapaz, alt. 1,230 m., June, 1886 (*H. von Tuerckheim* in exsicc. *J. D. Smith*, no. 933).

↔ ↔ Leaves ovate or ovate-oblong, crenate-serrate: corolla deep blue.

= Leaves thin, glabrous beneath: raceme slender, lax; the remote verticels 2-8 flowered: lower lip of calyx entire.

165. *S. PHAENOSTEMMA*, Donnell Smith, l. c. 13. — GUATEMALA, between Rodes and Malacate, Dept. San Marcos, alt. 430 to 1,080 m., Jan. 31, 1896 (*E. W. Nelson*, no. 3736).

= = Leaves tomentulose beneath: raceme rather dense, the verticels many-flowered: lower lip of calyx 2-lobed.

a. Bracts ovate-acuminate, herbaceous, cinereous-pubescent, 8 mm. or less in length: corolla-tube glabrous; galea short-pilose.

166. *S. MEXICANA*, L. Racemes becoming lax, 4 dm. or less long: calyx cinereous-pubescent on the nerves, in anthesis 1.5 cm. long. — Sp. 23; Cav. Ic. i. 16, t. 25; Benth. in DC. l. c. 337; Hemsl. l. c. ii. 561; Briq. in Engl. & Prantl, l. c. *S. melissifolia*, Desf. Cat. Hort. Par. Ed. 3, 94. *Jungia altissima*, Moench, Meth. 379. *Sclarea mexicana*, Dill. Hort. Elth. 339, t. 254, f. 330. — Central Mexico. Without locality (*Coulter*, no. 1100): GUANAJUATO, 1880 (*A. Dugès*): ZACATECAS, near Monte Escobedo, Apr. 26, 1897 (*J. N. Rose*, no. 2635): MEXICO, Tolkobaya, Aug. 10, 1865 (*Bilimek*, no. 308); Valley of Mexico, July 21, 1865, and Aug. 1, 1865 (*Bourgeau*, nos. 993, 619), Sept. 19, 1889 (*C. G. Pringle*, no. 2824); Rio Hondo Cañon, 1890 (*C. G. Pringle*, no. 3157).

Var. MAJOR, Benth. l. c. Similar but with glabrate calyx. — *S. papilionacea*, Cav. Ic. iv. 9, t. 319. *S. nitidifolia*, Ort. Dec. 53. — Without locality (*Coulter*, no. 1101): MEXICO, near City of Mexico (*Graham*).

Var. MINOR, Benth. l. c. Racemes shorter: calyx pubescent, in anthesis 0.9 to 1.3 cm. long. — *Ocimum micranthum*, Wats. Proc. Am. Acad. xxi. 435, not Willd. — Extending further north than the species. CHIHUAHUA, Frayles, 1885 (*Edw. Palmer* no. 290): near BATOPILAS, alt. 1,690 to 2,000 m., Oct. 4-5, 1898 (*E. A. Goldman*, no. 205): SAN LUIS POTOSI, near Morales, 1876 (*Schaffner*, no. 677); without locality, 1878 (*Parry & Palmer*, nos. 757, 758): ZACATECAS, Plateado, Sept. 3, 1897 (*J. N. Rose*, no. 3638): MEXICO, Toluca (*Andrieux*, no. 148); San Angel, May 31, 1866 (*Bourgeau*, no. 126); Amecameca, Jan. 5, 1899 (*C. C. Deam*); Tizapan, alt. 2,310 m., Sept. 23, 1899 (*C. G. Pringle*, no. 7936).

b. Bracts oblong-ovate, acuminate, membranaceous, veiny, glabrate, 2 cm. long: corolla long-pilose.

167. *S. lupulina*. Stems cinereous-puberulent: leaves ovate or



rhombic-ovate, acuminate at tip, rounded-cuneate at base, about 1 dm. long, appressed-serrate, green and sparingly puberulent above, canescent-puberulent beneath, on slender canescent petioles 8 cm. or less in length: racemes in bud resembling the fruit of the hop (*Humulus lupulus*); the membranaceous veiny bracts caducous: racemes becoming 1.5 dm. long; the verticels 10-many-flowered, the lowest a little remote: pedicels 1 cm. or less long, puberulent: calyx hispidulous at base, glabrate above, violet-tinged, in anthesis 1.3 to 1.7 cm. long; the tube 3 or 4 times exceeding the lobes; upper lip broad-ovate, short-acuminate, entire, lower with 2 narrower acuminate lobes: corolla 3 to 4.5 cm. long, the tube once to once and a half longer than the calyx; galea slightly exceeding the lip: style exerted, densely bearded. — OAXACA, mountains of San Juan del Estado, alt. 2,310 m., Sept. 11, 1894 (*L. C. Smith*, no. 167); near Tlapancingo, alt. 1,850 to 2,460 m., Dec. 7, 1894 (*E. W. Nelson*, no. 2068).

++ Leaves round round-truncate or cordate at base.

++ Leaves glabrous beneath.

= Bracts somewhat persistent, lasting through anthesis: calyx in anthesis 2 cm. long: corolla 5 cm. long, violet.

168. *S. IANTHINA*, Otto & Dietr. Allgem. Gartenz. xv. 362; De-caisne, Fl. des Serres, ix. 73, t. 884. — Habitat unknown, supposed to come from Mexico or Peru.

= = Bracts caducous.

a. Calyx villous.

1. Corolla violet, 3.75 to 5 cm. long, three or four times exceeding the calyx: leaves thin, long-acuminate, glandular-punctate.

169. *S. RECURVA*, Benth. in DC. l. c. 336; Hemsl. l. c. 564; Briq. l. c. — CHIAPAS, very rare in the forests (*Ghiesbreght*, nos. 24, 756). Originally collected in the Sierra de San Pedro Nolesco.

2. Corolla twice as long as the calyx.

170. *S. CONCOLOR*, Lamb. in Benth. Lab. 297; Benth. in DC. l. c.; Hemsl. l. c. 555. — Described from "Mexico."

b. Calyx glabrate, with acuminate-attenuate lobes: corolla 2.5 cm. long, thrice exceeding the calyx.

171. *S. GLABRATA*, HBK. l. c. 299; Benth. l. c.; Hemsl. l. c. 556; Briq. l. c. — Described from Venezuela, but reported from "Mexico" by Benth. l. c.

↔ ↔ Leaves pubescent beneath.

= Stem glandular-setulose: leaves setulose-hispid above, coarsely and irregularly serrate: calyx setulose-hispid: corolla barely 2 cm. long.

172. *S. BISERRATA*, Mart. & Gal. l. c. 66; Benth. l. c. 335; Hemsl. l. c. 553; Briq. l. c. — CHIAPAS (*Ghiesbreght*, no. 763). Described from Mt. Orizaba.

= Stem villous above, glabrate below: leaves minutely pubescent above, finely and regularly crenate-serrate: calyx pilose: corolla 2.5 to 3 cm. long.

173. *S. CYANEA*, Benth. Lab. 296, & in DC. l. c. 336; Hemsl. l. c. 555. *S. cyaniflora*, Dietr. in Otto & Dietr. l. c. i. 301. *S. cyanifera*, Otto in Benth. l. c. as syn. — Central Mexico. MEXICO, Désierto Viejo, Sept. 7, 1865 (*Bourgeau*, no. 837).

*E. Tubiflorae*, Benth. Shrubs (rarely herbs) with tubulose-campanulate calyx: corolla scarlet crimson flesh-colored or purple, rarely blue-violet; the tube straight or curved, cylindric or ampliate (not ventricose) above.

\* Leaves cuneate or narrowed at base. (Forms of *S. cinnabarina*, *elegans*, and *nervata* may be looked for here.)

+ Leaves pubescent beneath, corolla rose-purple.

↔ Leaves softly canescent-tomentose or cinereous-pilose beneath.

= Calyx minutely pilose, in anthesis 9 to 10 mm. long; the tube once and a half exceeding the ovate-lanceolate acuminate lobes: corolla 2.5 to 4 cm. long.

174. *S. CURVIFLORA*, Benth. Lab. 284, & in DC. l. c. 340; Hemsl. l. c. 555; Briq. l. c. — HIDALGO, Zimapan (*Coulter*, nos. 1088, 1089, 1090): MICHOACAN, Tlalpujahua (*Graham*).

= Calyx hispidulous: corolla 1.5 to 1.8 cm. long.

175. *S. chiapensis*. Fruticose (?), the tall simple branches puberulent below, pilose-hispid above: leaves thick, ovate or oblong-ovate, appressed-serrate, acuminate at tip, subcuneate at base, 5 to 12 cm. long, green and minutely pilose above, canescent and subvelutinous beneath, on puberulent petioles 3.5 cm. or less in length: raceme 3 to 4 dm. or less long; the verticels 6-10-flowered, all becoming remote, the lowest 3 to 4 cm. apart: bracts oblong-ovate, acuminate, short-pubescent, 1.5 cm. or less in length, caducous: pedicels becoming 5 mm. long: calyx in anthesis 7 to 8 mm. long; the tube nearly twice exceeding the ovate-lanceolate acuminate lobes: corolla-tube about twice exceeding the calyx; the densely villous galea about equalling the lip: style bearded. — CHIAPAS, without locality (*Ghiesbreght*, nos. 57, 761); near San Cristobal, alt. 2,150 to 2,460 m., Sept. 18, 1895 (*E. W. Nelson*, no. 3201).

= = = Calyx long-pilose; corolla 2.5 to 3 cm. long.

176. *S. venosa*. Herbaceous, with erect branches; stem hollow, strongly quadrangular, pilose: leaves thin, ovate or rhombic ovate, crenulate-serrate, short-acuminate at tip, rounded-cuneate at base, 3.5 to 8 cm. long, green and short-pilose above, conspicuously veiny and cinereous-pilose beneath; the upper most often sessile, the others on slender pilose petioles 2.5 cm. or less in length: racemes 0.6 to 1.2 dm. long; the rhachis white-pilose, densely so in the axils; verticels 2-8-flowered, all remote, the lowest 1 to 2 cm. apart: pedicels filiform, white-pilose, becoming 5 mm. long: calyx in anthesis 7 mm. long; the tube thrice exceeding the ovate short-acuminate lobes: corolla villous; the tube twice longer than the calyx; the galea 5 mm. long, arcuate-cucullate above the short lip: style bearded. — CHIAPAS, on plains, Aug. (*Ghiesbreght*, no. 749); near San Cristobal, alt. 2,150 to 2,460 m., Sept. 18, 1895 (*E. W. Nelson*, no. 3138).

↔ ↔ Shrub with oblong-lanceolate leaves green and sparingly pilose beneath: rhachis and calyx glandular-pilose; the upper calyx-lip 3-dentate, the middle tooth filiform-appendiculate: corolla 1.5 cm. long.

177. *S. ANTENNIFERA*, Briq. Ann. Conserv. Jard. Bot. Genève, ii. 168. — Described from CHIAPAS. Not seen.

← ← Leaves glabrous beneath or merely puberulent on the nerves.

↔ Leaves ovate: corolla scarlet or carmine.

178. *S. TUBIFERA*, Cav. Ic. i. 16, t. 25; Lindl. Bot. Reg. xxvii. t. 44; Benth. l. c. 341; Hemsl. l. c. 566; Briq. in Engl. & Prantl. l. c. *S. longiflora*, Willd. Spec. i. 141. — Described from Mexico. Not seen.

↔ ↔ Leaves oblong, 2 cm. long: corolla blue-violet.

179. *S. ZACUALPENSIS*, Briq. Ann. Conserv. Jard. Bot. Genève, ii. 166. — Described from CHIAPAS. Not seen.

↔ ↔ ↔ Leaves oblong-lanceolate, 1.5 to 2 dm. long.

= Verticels 2-flowered: calyx 1.7 cm. long: corolla crimson-violet.

180. *S. BELLA*, Briq. l. c. 169. — Described from COSTA RICA. Not seen.

= = Verticels 4-6-flowered: calyx in anthesis 9 mm. long: corolla vermilion.

181. *S. miniata*. Glabrate shrub: branches very slender, deeply furrowed: leaves thin, minutely puberulent on the nerves above, otherwise glabrous, long-acuminate at both ends, sharply serrate; petioles 1 to 2 cm. long: peduncle 1 dm. long; raceme slightly longer; verticels

remote, the lowest 3 to 4 cm. apart: pedicels puberulent, 3 mm. long: calyx minutely puberulent or glabrate; the tube thrice longer than the lips; upper lip broad-ovate, blunt or short-mucronate, lower with two short incurved subulate teeth: corolla 3 to 3.25 cm. long, slightly curved, short-pilose; the tube twice longer than the calyx; the galea and lip subequal: style glabrous or very slightly bearded. — CHIAPAS, in the forests, flowering in June (*Ghiesbreght*, no. 760).

\* \* Leaves rounded or cordate at base. (*S. curviflora* may be looked for here.)

+ Leaves rounded or rounded-truncate at base, not definitely cordate.

↔ Leaves lanceolate, 1 to 1.5 dm. long.

182. *S. perlonga*. Shrub with pilose-hispid branches: leaves thick, with long-attenuate tips, crenulate-serrate, rugose and covered with short dense plush-like indumentum above, canescent-velutinous beneath, on canescent petioles 2 cm. or less long: racemes 1 to 2 dm. long; verticels 2-8-flowered, all remote; pedicels and rhachis sordid glandular-pilose: calyx purplish, glandular, pilose-hispidulous, in anthesis 1.3 cm. long, the tube twice exceeding the blunt ovate entire lips: corolla vermilion, 3 cm. long, the slightly ventricose tube twice exceeding the calyx; the minutely pilose lips subequal: style slightly bearded. — GUERRERO, northeast slope of Sierra Madre, near Chilpancingo, alt. 2,150 to 2,620 m., Dec. 24, 1894 (*E. W. Nelson*, no. 2186). Further material may show this to belong with the *Fulgentes*.

↔ ↔ Leaves ovate or ovate-lanceolate, shorter.

= Corolla purple rose-purple or flesh-colored.

a. Leaves glabrous or only minutely puberulent beneath, not pilose (except slightly so in var. of *S. purpurea*).

1. Branches canescent-velutinous: verticels 2-flowered.

183. *S. GRACILIFLORA*, Mart. & Gal. l.c. 75; Benth. l.c. 342; Hemsl. l.c. 557. — Described from Zacuapan. Not seen.

2. Branches slightly pilose, puberulent or glabrous: verticels several-many-flowered.

○ A pair of glands generally present at the base of the petiole: corolla slender, puberulent, 2 to 2.75 cm. long.

184. *S. PURPUREA*, Cav. Minutely puberulent or glabrous. — Ic. ii. 52, t. 166; Jacq. Hort. Schoenb. iii. 2, t. 253; Benth. l.c. 341; Hemsl. l.c. 564; Briq. l.c. *S. affinis*, Cham. & Schl. Linnaea, v. 99; Benth. l.c.; Hemsl. l.c. 552; Briq. l.c. — Southern Mexico and Central America. JALISCO, Bolaños (*Hartweg*, no. 161): MORELOS, Cuernavaca,

Nov. 14, 1865 (*Bourgeau*, no. 1244): VERA CRUZ, region of Orizaba, without date (*Botteri*, no. 576), Oct. 2, 1866 (*Bourgeau*, no. 3162), Feb.-May, 1885 (*A. Gray*), March 10, 1894 (*E. W. Nelson*, no. 189): JALAPA, alt. 1,230 to 1,380 m., Jan., 1894 (*C. L. Smith*, no. 1781): OAXACA, near Oaxaca, alt. 1,600 to 2,090 m., Oct. 2, 1894, and near Tlapancingo, alt. 1,850 to 2,460 m., Dec. 7, 1894 (*E. W. Nelson*, nos. 1501, 2087); Sierra de San Felipe, alt. 2,000 m., Sept. 23, 1895 (*C. Conzatti*, no. 717): CHIAPAS, without locality (*Ghiesbreght*, no. 128); near Yajalon, Nov. 21, 1895, between San Cristobal and Teopisca, alt. 2,060 to 2,610 m., Dec. 4, 1895, and valley of Comitán, alt. 1,780 to 2,000 m., Dec. 8, 1895 (*E. W. Nelson*, nos. 3401, 3478, 3484): GUATEMALA, Cobán, Dept. Alta Verapaz, alt. 1,320 m., Nov., 1886 (*H. von Tuerckheim* in exsicc. J. D. Smith, no. 500); Castillas, Dept. Santa Rosa, alt. 1,230 m., Jan., 1893 (*Heyde & Lux* in exsicc. J. D. Smith, no. 4398): COSTA RICA (*Oersted*).

Var. PUBENS, Gray. Stems and leaves slightly pilose. — Proc. Am. Acad. xxii. 446. — JALISCO, deep ravines and shaded hillsides, Rio Blanco, Oct., 1886 (*Edw. Palmer*, no. 662); near Guadalajara, Oct. 2, 1889 (*C. G. Pringle*, no. 2458).

○ ○ No glands at base of petiole: corolla hardly slender, villous, 2.5 to 4 cm. long.

185. *S. LITTAE*, Vis. Ill. Piant. Nuov. Ort. Padov. 15; Benth. l. c.; Hemsl. l. c. 560; Briq. l. c. — OAXACA, near Oaxaca, alt. 2,300 to 2,930 m., Sept., 1894 (*E. W. Nelson*, no. 1342); Sierra de Clavellinas, alt. 2,770 m., Oct. 18, 1894 (*C. G. Pringle*, no. 4991); Rancho de Caciques, alt. 1,540 m., Sept. 5, 1895 (*L. C. Smith*, no. 698).

b. Leaves more or less pilose or tomentose beneath.

1. Pubescence simple.

○ Leaves merely pilose beneath.

+ Leaves broad-ovate: corolla deep purple-violet.

186. *S. iodantha*. Stem 0.9 to 1.5 m. high, puberulent, much branched above: leaves short-acuminate, serrate, the larger ones 7 cm. long, 4.75 cm. broad, sparingly pubescent above, canescent beneath, slender-petioled: racemes long, rather loosely flowered, subsecund, 1 to 2 dm. long; verticels 6-10-flowered, all remote, the lowest 3 to 4 cm. apart: pedicels slender, about equalling the calyx: calyx in anthesis 5 mm. long, slightly hispid on the nerves and glandular-dotted; lobes very short, broad-ovate, mucronate-acuminate: corolla villous, 2 cm.

long; the galea exceeding the drooping lip: stamens and style exserted, glabrous. — MORELOS, mountain side above Cuernavaca, alt. 707 m., Feb. 5, 1899 (*C. G. Pringle*, no. 8039).

++ Leaves ovate-lanceolate; corolla flesh-colored.

187. *S. michoacana*. Shrub 1.5 to 3 m. high, the branches puberulent: leaves 0.3 to 1.2 dm. long, 1 to 6 cm. broad, long-acuminate, minutely pilose or glabrate above, canescent or glabrate beneath, slender-petioled: racemes dense, 1.5 dm. or less long; the lower verticels often in the axils of the upper leaves: calyx in anthesis 4 mm. long, otherwise as in the last: corolla villous, slender, 2 to 2.5 cm. long; the galea exceeding the lip: stamens and style exserted, glabrous. — MICHOCAN, dry wooded hills near Patzcuaro, Nov. 12, 1890, and Nov. 24, 1891 (*C. G. Pringle*, nos. 3600, 3946): JALISCO, between San Sebastian and the summit of Mt. Bufa de Mascota, alt. 1,380 to 2,150 m., March 20, 1897 (*E. W. Nelson*, nos. 4102, 4104).

○○ Leaves velutinous or lanate beneath.

+ Leaves serrate: calyx setulose-hispid or glabrate, with short broad mucronate lobes.

188. *S. NERVATA*, Mart. & Gal. l. c. 77; Benth. l. c. 339; Hemsl. l. c. 561; Briq. l. c. *S. monochila*, Donnell Smith, Bot. Gaz. xxiii. 13. — Southern Mexico and adjacent Central America. GUATEMALA, Tondos Santos, Dept. Huehuetenango, alt. 3,080 m., Dec. 26, 1895 (*E. W. Nelson*, no. 3635). Originally from OAXACA. Capt. Smith distinguishes his *S. monochila* from *S. nervata* by its pubescent calyx and scarlet corolla. In the specimen of Nelson's no. 3635 at hand, however, the corolla is distinctly purple, not scarlet, and there seems little else to keep the two apart.

++ Leaves crenate: calyx glandular-villous; the lobes long-acuminate.

189. *S. KARWINSKII*, Benth. Lab. 725, & in DC. l. c. 345; Hemsl. l. c. 558; Briq. l. c. — Described from "Mexico." Not seen.

○○○ Of close affinity to the preceding but not identified is

190. *S. EXCELSA*, Benth. Bot. Reg. xxvii. Misc. 90, & in DC. l. c. 342, described from GUATEMALA and said to be near *S. tubifera* but with the 2-4-flowered verticels in an elongated loose raceme.

## 2. Pubescence stellate.

191. *S. Rosei*. Shrub with dark gray bark; branches canescent with minute stellate pubescence: leaves ovate, appressed-serrate, blunt or



acute, 3.5 to 6 cm. long, dull and sparingly puberulent above, closely canescent-puberulent beneath; petioles canescent, 2 cm. or less long: racemes simple, 1 dm. or less in length; verticels 2-6-flowered: pedicels slender, 2 to 4 mm. long: calyx canescent, in anthesis 1.2 to 1.3 cm. long, the tube becoming corrugated at base, broadened above, twice exceeding the ovate-lanceolate acuminate subequal lobes: corolla 2.5 to 3 cm. long, purple-violet, villous, the tube twice exceeding the calyx; the lip one half as long as the galea: style long-exserted, villous. — JALISCO, between Colotlan and Bolaños, Sept. 8, 1897 (*J. N. Rose*, no. 2844).

= = Corolla scarlet or vermilion, without purple tinge.

a. Upper lip of calyx prolonged into a subulate awn, nearly or quite equalling the calyx-tube; lower lip with 2 short subulate teeth.

192. *S. CINNABARINA*, Mart. & Gal. l. c. 63; Benth. l. c.; Hemsl. l. c. 554; Briq. l. c., & Ann. Conserv. Jard. Bot. Genève, ii. 169 (including varieties). — Southern Mexico and Central America. OAXACA, near Oaxaca, alt. 2,310 to 2,920 m., Sept., 1894 (*E. W. Nelson*, no. 1345) Sierra de San Felipe, alt. 460 m., Oct. 5, 1894 (*C. G. Pringle*, no. 4947); San Juan del Estado, alt. 2,300 m., Nov. 4, 1894 (*L. C. Smith*, no. 273); CHIAPAS (*Ghiesbreght*, nos. 72, 757): GUATEMALA, San Miguel Uspantan, Dept. Quiché, alt. 1,850 m., Apr., 1892, and Buena Vista, Dept. Santa Rosa, alt. 1,700 m., Dec., 1892 (*Heyde & Lux* in exsicc. *J. D. Smith*, nos. 3118, 4381).

b. Calyx-lips subequal.

1. Calyx-lobes subulate tipped.

193. *S. ELEGANS*, Vahl. Leaves mostly broad-ovate, subtruncate or rounded at base, rarely exceeding 7 cm. in length: rhachis and calyces sordid glandular-villous. — Enum. i. 238, 362; DC. l. c. 342; Hemsl. l. c. 555; Briq. in Engl. & Prantl, l. c. *S. incarnata*, Cav. Ann. Cienc. Nat. ii. 112; HBK. l. c. 293, t. 144; not Etling. *S. microculis*, Poir. Dict. vi. 614. *S. punicea*, Mart. & Gal. l. c. 65. *S. microcalyx*, Scheele, Linnaea, xxii. 589. *S. longiflora*, Sease & Moc. l. c. 8. — Central and southern Mexico. Without locality (*Coulter*, no. 1097): GUANAJUATO, without locality, Dec., 1827 (*Berlandier*, no. 1319); oak woods (*Hartweg*, no. 162): QUERETARO, Nov. 13, 1827 (*Berlandier*, no. 1245): MEXICO, Santa Fé, July 24, 1865 (*Bourgeau*, no. 489); woods of Maromenas, Oct. 11, 1865 (*Bourgeau*, no. 1111); Valley of Mexico (*Schaffner*, no. 395); woods of Esilava, alt. 2,400 m., Jan. 31, 1899 (*C. G. Pringle*, no. 7711): MICHOACAN, Talpajahua

(*Graham*); rich cañons, hills near Patzcuaro, Dec. 22, 1891 (*C. G. Pringle*, no. 3981): VERA CRUZ, Mt. Orizaba (*Botteri*, no. 578), alt. 3,080 m., Aug. 5, 1891 (*Seaton*, no. 514); Cruz Verde, near Jalapa, alt. 2,130 m., 1894 (*C. L. Smith*, no. 1480): GUERRERO, near Chilpancingo, alt. 2,770 to 3,140 m., Dec. 24, 1894 (*E. W. Nelson*, no. 2245): OAXACA, Sierra de San Felipe, alt. 3,080 m., Aug. 8, 1894 (*C. G. Pringle*, no. 5779).

Var. *sonorensis*. Leaves long-acuminate, mostly cuneate at base, about 1 dm. long: rhachis and calyces pilose, only slightly glandular. — SONORA, Alamos, 1890 (*Edw. Palmer*, no. 292); Huehuerachi, alt. 1,230 m., Dec. 6, 1890 (*C. V. Hartman*, no. 312): damp cañon, Rinconardo Mts., Dec. 27, 1890 (*F. E. Lloyd*, no. 449): CHIHUAHUA, Hacienda San Miguel, 1885 (*Edw. Palmer*, no. 270); near Batopilas, alt. 1,690 to 2,000 m., Oct. 4, 5, 1898 (*E. A. Goldman*, no. 206).

2. Calyx-lobes not subulate-tipped.

○ Bracts 2 to 3 cm. long, persistent.

194. *S. MOLLISSIMA*, Mart. & Gal. l. c. 71; Benth. l. c. 342; Hemsl. l. c. 561. — Described from OAXACA. Not seen.

○○ Bracts smaller, deciduous.

195. *S. COCCINEA*, Juss. Stems canescent-puberulent. — Juss. ex Murr. Comm. Gott. i. (1778) 86, t. i.; Benth. l. c.; Regel, Gartenfl. vii. t. 232; Morren, Belg. Hort. ix. t. 5; Gray, Syn. Fl. l. c. 368; Hemsl. l. c. 555; Briq. l. c. *S. rosea*, Vahl, l. c. 244. *S. glaucescens*, Pohl, Fl. Bras. Ic. ii. 136, t. 192. — Of broad range in the Southern United States, the West Indies, South America, and India, rare in Mexico. Reported by Benth. l. c. from Matamoros, TAMAULIPAS.

Var. *PSEUDO-COCCINEA*, Gray. Stems conspicuously hirsute. — Syn. Fl. l. c. *S. pseudo-coccinea*, Jacq. Coll. ii. 302, & Ic. Rar. ii. 2. t. 209; Hook. Bot. Mag. t. 2864; Benth. l. c.; Paxton, Fl. Gard. ii. t. 40; Briq. l. c. *S. ciliata*, Benth. Lab. 286. *S. Galeottii*, Mart., in Mart. & Gal. l. c. 75. — Central and southern Mexico and Central America. NUEVO LEON, Papagallas, Dec., 1852 (*Geo. Thurber*, no. 872); Guajuco, March, 1880 (*Edw. Palmer*, no. 1074): SAN LUIS POTOSI, near Tancanhuitz, alt. 370 m., May 1, 1898 (*E. W. Nelson*, no. 4376); OAXACA, Chiquihuitlan, alt. 1,230 m., Aug. 16, 1895 (*L. C. Smith*, no. 619): CHIAPAS (*Ghiesbreght*, no. 752); valley of Jiquipilas, alt. 675 to 820 m., Aug., 1895 (*E. W. Nelson*, no. 2942): YUCATAN, Chichen Itza, Jan. 18, 1895 (*C. F. Millspaugh*, no. 116); Izamal, 1895 (*G. F. Gaumer*, no. 453).

Var. *minima*. Low, subsimple, resembling the last, but the leaves very small, rarely exceeding 2 cm. in length, densely long-setulose above. — CHIAPAS, table-land about Ocuilapa, alt. 1,040 to 1,170 m., Aug. 21, 1895 (*E. W. Nelson*, no. 3062).

+ + Leaves cordate. (*S. coccinea* may be looked for here.)

↔ Corolla purple or flesh-colored: calyx in anthesis 2 to 2.5 cm. long, with elongate setiform tips to the lobes.

196. *S. ARISTULATA*, Mart. & Gal. l. c. 67; Benth. l. c. 340; Hemsl. l. c. 553, Briq. l. c. *S. longistyla*, Benth. l. c. 344; Hemsl. l. c. 560; Briq. l. c. — Southern Mexico. JALISCO, mountains near Lake Chapala, Dec. 16, 1889 (*C. G. Pringle*, no. 2421): OAXACA, Valley of Oaxaca, alt. 1,570 m., Nov. 14, 1894 (*L. C. Smith*, no. 306); near Tlapancingo, alt. 1,850 to 2,460 m., Dec. 7, 1894 (*E. W. Nelson*, no. 2085).

↔ ↔ Related to the above but of doubtful affinity is

197. *S. OTTONIS*, Lehm. in *E. Otto*, Hamb. Gartenz. vi. 350; Regel, Gartenfl. vii. 129, & Bot. Zeit. xi. 335.

↔ ↔ ↔ Corolla scarlet or vermillion.

= Calyx in anthesis 1.75 to 2 cm. long.

a. Leaves white-tomentose beneath.

198. *S. INCANA*, Mart. & Gal. l. c. 68; Benth. l. c. 344; Hemsl. l. c. 558. — Described from PUEBLA. Not seen.

b. Leaves slightly pilose on the nerves beneath.

199. *S. TUBIFORMIS*, Link, Kl. & Otto, Ic. Rar. 70, t. 28; Benth. l. c. 334, under *S. rectiflora*. *S. rectiflora*, Hemsl. l. c. 564, in part, not Vis. — Described and figured from garden specimens. Perhaps native of Mexico.

= = Calyx in anthesis 1 cm. long.

200. *S. cyclophylla*. Shrub with dark brown bark; branches glandular-hispid: leaves from suborbicular to broad-ovate, rounded or bluntish at tip, crenate, 6 to 7 cm. across, minutely pilose above, more densely so beneath, all but the uppermost on slender petioles 3 to 4 cm. long: raceme 5 to 6 cm. long, the 4-8-flowered verticels 1.5 to 2 cm. apart: pedicels 3 mm. long, hirsute: calyx glandular-hirsute on the veins; the tube twice exceeding the lobes; upper lip suborbicular, blunt or mucronate, lower with ovate mucronate-acuminate lobes: corolla pilose, 2.5 to 2.75 cm. long; the tube once and a half longer than the calyx;

the short blunt galea equalling the lip: style barely exerted, bearded. — Between Tlapancingo, OAXACA and Tlalixtaquilla, GUERRERO, alt. 1,240 to 1,600 m., Dec. 9, 1894 (*E. W. Nelson*, no. 2093, in part.)

→ → → → Related to the above is

201. *S. GLUMACEA*, HBK. l.c. 298, a very doubtful species probably of this group, the corolla, however, being unknown. Described from "New Spain."

*F. Hastatae*, Benth. Perennial herbs: leaves mostly or entirely basal, hastate or angulate-cordate: racemes simple or commonly branching, glutinous-villous: corolla blue; the tube ventricose, ampliate above.

\* Calyx in anthesis 1.3 to 1.8 cm. long: corolla 4.5 to 6 cm. long: leaves from broad-hastate to rounded at base, pubescent on both faces.

202. *S. PATENS*, Cav. Ic. v. 33, t. 454; Lindl. Bot. Reg. xxv. t. 23; Hook. Bot. Mag. t. 3808; Paxton, Mag. vi. 1; Benth. l.c. 348; Planch. Fl. des Serres, v. t. 503; Hemsl. l.c. 562; Briq. l.c. 284. *S. grandiflora*, Née ex Cav. l.c. *S. spectabilis*, HBK. l.c. 304. *S. macrantha*, Schl. Ind. Sem. Hort. Hal. 1841. *S. decipiens*, Mart. & Gal. l.c. 64. *S. staminea*, Mart. & Gal. l.c. 65. *S. glutinosa*, Sessé & Moc. l.c. 7, not L. — Central Mexico. Without locality (*Coulter*, no. 1102): SAN LUIS POTOSI, mountains of San Miguelito, 1876 (*Schaffner*, no. 676); without locality, alt. 1,850 to 2,460 m., 1876 (*Parry & Palmer*, no. 759): GUANAJUATO, rocky hillsides, Guanajuato, Aug., 1894 (*A. Dugès*, no. 228).

\* \* Calyx in anthesis 5 to 8 mm. long.

← Leaves villous beneath; the margins crenate.

→ Calyx-lobes elongated, subulate-aristate: leaves angulate-lobed.

203. *S. VITIFOLIA*, Benth. Lab. 724, & in DC. l.c.; Hemsl. l.c. 566; Briq. l.c. — Southern Mexico. VERA CRUZ, Maltrata, alt. 1,700 m., Aug. 16, 1891 (*Seaton*, no. 376): OAXACA, Sierra de San Felipe, alt. 2,310 m., May 26, 1894 (*C. G. Pringle*, no. 4659), Sept. 1, 1894 (*E. W. Nelson*, no. 1169); San Juan del Estado, alt. 2,160 m., June 4, 1894 (*L. C. Smith*, no. 169); Cañada de San Gabriel, Etla, alt. 600 m., June 13, 1897 (*C. Conzatti*, no. 328).

→ → Calyx-lobes short-aristate: leaves generally slightly or not at all angulate-lobed.

204. *S. CACALIAEFOLIA*, Benth. l.c.; Hemsl. l.c. 554; Briq. l.c. — CHIAPAS, in pine forests (*Ghiesbreght*, no. 754); near San Cristobal, alt. 2,160 to 2,700 m., Sept. 18, 1895 (*E. W. Nelson*, nos. 3230, 3236 g).

— Leaves short-pilose beneath; margins subentire.

205. *S. atriplicifolia*. Tall, 1 m. high: stem glandular-pilose, especially above, leafy nearly to the inflorescence: leaves broadly angulate-deltoid, acuminate, glabrate above, pale beneath, mostly 1 dm. long and broad, on pilose petioles 5 cm. or less in length: inflorescence paniculate, 2.5 to 3 dm. long; the verticels mostly 2-flowered, a little remote: bracts linear, glandular-hispid, 2 mm. long: pedicels 5 mm. long: calyx glandular-puberulent, with ciliate margins, in anthesis 5 mm. long, the ovate-lanceolate lobes with short-subulate tips; upper lip 2-3-dentate: corolla pilose, dark blue, 3 cm. long: style glabrous. — CHIAPAS, among the mountains, flowering in October (*Giesbreght*, no. 759).

Section IX. PYCNOSPHACE, Benth. Bracts imbricated. Calyx ovate; the upper lip tridentate, the lower bifid, all the teeth spinescent. Corolla-tube pilose-annulate within; the galea erect, emarginate-bifid; the lip with small lateral lobes, the larger middle one lacerate-fimbriate or dentate. Herbs with flowers in dense glomerules or verticels.

\* Leaves deeply pinnatifid: verticels 1 or 2.

206. *S. COLUMBARIÆ*, Benth. Lab. 302, & in DC. l. c. 349; Gray, Syn. Fl. l. c. 367; Briq. l. c. — Southwestern United States and adjacent Mexico. LOWER CALIFORNIA, San Quentin, 1889 (*Edw. Palmer*, no. 620).

\* \* Leaves crenate.

207. *S. LEONIA*, Benth. Lab. 303, & in DC. l. c.; Hemsl. l. c. 559; Briq. l. c. *Leonia salvifolia*, Llav. & Lex. Nov. Veg. Descr. fasc. 2, 6. — Described from "Santa Rosa."

Section X. HETEROSPHACE, Benth. Calyx tubulose, the upper lip truncate, tridentate. Corolla-tube pilose-annulate within or rarely subnaked; the galea short, erect, the lower lip with small somewhat spreading lateral lobes. Herbs with loose racemes of few-flowered verticels.

\* Corolla scarlet: stems hirsute: leaves petioled, reniform-cordate, repand-toothed or pinnatifid.

208. *S. ROEMERIANA*, Scheele, Linnaea, xxii. 586; Torr. Bot. Mex. Bound. 132; Gray, Syn. Fl. l. c. 367; Hemsl. l. c. 564; Briq. l. c. 285. *S. porphyrantha*, Decne. Rev. Hort. ser. 4, iii. 301, t. 16; Planch. Fl. des Serres, xi. t. 1080. *S. porphyrata*, Hook. Bot. Mag. t. 4939. — Texas and adjacent Mexico. CHIHUAHUA, Sta. Eulalia Mts., March 27, 1885 (*C. G. Pringle*): COAHUILA, mountains near Saltillo, July, 1880

(*Edw. Palmer*, no. 1073): NUEVO LEON, limestone hills, near Monterey, July 16, 1889 (*C. G. Pringle*, no. 2869).

\* \* Corolla blue: stems lanate: leaves sessile, coarsely and pungently dentate.

209. *S. CALIFORNICA*, Brandegee, *Proc. Cal. Acad.*, ser. 2, ii. 197. — LOWER CALIFORNIA, Calmalli, Cardon Grande, Apr. 23, 1889 (*T. S. Brandegee*).

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## II. — A REVISION OF THE MEXICAN AND CENTRAL AMERICAN SOLANUMS OF THE SUBSECTION TORVARIA.

Dunal's subsection *Torvaria* of the genus *Solanum* has never been understood in America. Almost without exception the many diverse forms from equally diverse regions have been in American herbaria placed under the type species *Solanum torvum*, Swartz. This treatment as a single polymorphous species of all the plants of similar subgeneric character, — a course by no means without precedent in other sections of *Solanum* and scores of other tropical American genera; — has been due to a lack of authentic material and of any more concise statement of the specific characters than can be found in the rather ponderous monograph of Dunal. An accumulation of specimens from many sources has made it possible to divide the Mexican material passing in the Gray Herbarium as *Solanum torvum* into species of marked morphological characters and restricted geographical ranges. Most of these plants thus separated are found to agree very well with the descriptions of different species recognized from Mexico by Dunal in his monograph, though three species there characterized have not yet been identified with modern herbarium material. Doubtless these identifications of modern Mexican specimens with the old descriptions cannot all be taken as final, and a study of the type specimens, when it is possible to examine them, may prove the present conclusions to be in some cases inaccurate. Yet confidence is felt that the present understanding of the group is much clearer than that which has prevailed among recent students of Mexican botany. With the hope of simplifying the future study of the group the following synopsis is presented of the Mexican species of the section as now interpreted.

- \* Pubescence of flowering branches densely stellate-tomentose, hairs short and fine.
- + Pedicels bearing simple gland-tipped hairs among the stellate ones. (See also *S. ochraceo-ferrugineum*.)

*S. TORVUM*, Swartz. Branches slightly armed, canescent-ochraceous, the young parts, especially, ochraceous: leaves subcordate-ovate, shallowly sinuate-lobed, olive-green and stellate-scabrous above, canescent and stellate-tomentose beneath, 1 to 1.5 dm. long, 6 to 12 cm. broad, often sparingly armed on the midrib beneath, more rarely so above:

corymb generally bifid or trifid, many-flowered, cymose, the fruiting pedicels mostly ascending. — Prodr. 47; Dunal, Sol. 203, t. 23, & in DC. Prodr. xiii. 260. — Originally described from the West Indies, where it is common. In Mexico known only from the South. CHIAPAS, near Huehuetan, alt. 150 to 615 m., Feb. 22, 1896 (*E. W. Nelson*, no. 3830).

Var. *RUBIGINOSUM*, Dunal, l. c. 261, described from Guatemala, apparently differs from the species only in its more ferrugineous pubescence. — GUATEMALA, Rio Dulce, Depart. Livingston, March, 1889 (*J. Donnell Smith*, no. 1840): NICARAGUA (*C. Wright*).

*S. HERNANDESI*, Moc. & Sessé. More spiny throughout, the branches more loosely sordid-tomentose: leaves deeply and sinuately 5-7-lobed, the lobes sometimes pinnatifid: inflorescence at first subcorymbose, simple or bifid, becoming distinctly racemose: fruiting pedicels spreading. — Moc. & Sessé in Dunal, l. c. 266. — CHIAPAS, mountains near Tonalá, alt. 600 to 1,050 m., Aug. 14, 1895, table land about Ocuilapa, alt. 1,050 to 1,170 m., Aug. 21, 1895 (*E. W. Nelson*, nos. 2904, 3029): GUATEMALA, San Miguel Uspantán, Depart. Quiché, alt. 1,850 m., April, 1892 (*Heyde & Lux* in exsicc. *J. D. Smith*, no. 3446): NICARAGUA (*C. Wright*).

*S. madreense*. Shrubby, the young branches loosely stellate-tomentose with canescent or ochraceous hairs, and armed with straight or slightly curved prickles: leaves thick, ovate to ovate-lanceolate, acuminate, unequally subcordate at base, subentire or bluntly and shallowly sinuate-angulate, without the petiole (1 to 3 cm.) 5 to 15 cm. long, 4 to 13 cm. wide, above olive-green, stellate-scabrous, beneath a little paler and tomentulose, sometimes slightly armed; young leaves often aureate-tinged, and velutinous: inflorescences extra-axillary, in maturity 4 to 9 cm. long, simple or bifid, scorpioid-racemose; the pedicels glandular hairy, spreading and reflexed in fruit: calyx-lobes lanceolate, long-acuminate: corolla 2 cm. long, 3 cm. broad, whitish, deeply lobed, the lobes lanceolate or lance-ovate, acutish: filaments very short; anthers subequal, slender, 8 or 10 mm. long: the style somewhat longer: berry apparently black, glabrous, 1 to 1.5 cm. in diameter. — *S. diversifolium*, Wats. Proc. Am. Acad. xxi. 434, not Schl. *S. torvum*, Wats. l. c. xxii. 441, not Swartz. — The common representative of the group in the Sierra Madre and westward to the Pacific. SONORA, Sierra de los Alamos, March 25 to Apr. 8, 1890 (*Edw. Palmer*, nos. 363, 364): CHIHUAHUA, Hacienda San Miguel, 1885 (*Edw. Palmer*, no. 22): TEPIC, San Blas, June 6, 1897 (*E. W. Nelson*, no. 4335): SINALOA, Mazatlan,

Dec. 1894, and Isla Piedra, near Mazatlan, Dec. 31, 1894 (*Frank H. Lamb*, nos. 336, 336\*); Rosario, June 20, 1897, and foothills of the Sierra Madre, near Colomas, July 20, 1897 (*J. N. Rose*, nos. 1402, 1777): JALISCO, barranca near Guadalajara, June, 1886 (*Edw. Palmer*, no. 106); near Guadalajara, Nov. 14, 1888, May 27, 1891 (*C. G. Pringle*, nos. 2193, 5140 [type]); mountains near Talpa, alt. 1,200 to 1,540 m., March 7, 1897, Maria Madre Isl., May 3-25, 1897 (*E. W. Nelson*, nos. 4040, 4185): COLIMA, Colima, Jan. 9-Feb. 6, 1891 (*Edw. Palmer*, no. 1179): GUERRERO, Acapulco, Nov. 1894 (*Edw. Palmer*, no. 148).

+ + Pedicels not glandular.

↔ Pubescence of branches and lower face of leaves whitish-lanate.

S. HARTWEGI, Benth. Essentially unarmed, branches rarely with a few spines: leaves from oblong-lanceolate to ovate, entire or sinuate-repand, acuminate, pale green above, the younger stellate-velutinous, the older scabrous: cymes many-flowered, the branches scorpioid; peduncles pedicels and calyx white-lanate; fruiting pedicels mostly erect: ripe fruit red, glabrous, 1 cm. or more in diameter. — Pl. Hartw. 68; Dunal, l. c. 262. *S. torvum*, var. *lanatum*, Dunal, l. c. 261. — Hartweg's original specimen was from Hacienda del Carmen. Dunal's variety was based upon a Guatemala specimen. The following are referred here: MEXICO, Valley of Mexico, Nov. 27, 1865 or 1866 (*Bourgeau*, no. 725): VERA CRUZ, Valley of Cordova, Jan. 16, 1865 or 1866 (*Bourgeau* no. 1671); region of Orizaba, May to July (*Bourgeau*, nos. 2408, 2556, *Botteri*, nos. 82, 1083, *Seaton*, no. 142); Santa Lucretia, Isthmus of Tehuantepec, Feb., 1895 (*C. L. Smith*, no. 1071): OAXACA, hills near Oaxaca, alt. 1,850 m., Sept. 8, 1894 (*C. G. Pringle*, no. 4891); Monte Alban, alt. 1,690 m., Nov. 24, 1894 (*L. C. Smith*, no. 341); near Totontepec, alt. 1,690 m., vicinity of Choapam, alt. 1,170 to 1,385 m., vicinity of Yalalag, alt. 1,230 to 2,400 m., July, 1894 (*E. W. Nelson*, nos. 788, 835, 952); Tillantongo, Dec. 12, 1895 (*Ed. Seler*, no. 1591): GUATEMALA, San Siguán, Depart. Quiché, alt. 1,785 m., May, 1892 (*Heyde & Lux* in exsicc. J. D. Smith, no. 3446): COSTA RICA, Cartago, Prov. Cartago, alt. 1,300 m., Nov., 1887 (*Juan J. Cooper* in exsicc. J. D. Smith, no. 5872). Palmer's no. 637 from San Luis Potosi, 1878, may be an attenuated form of this.

↔ ↔ Pubescence ochraceous or fuscous.

= Branches more or less armed.

S. FENDLERI, Van Heurck & Müll. Arg. Sparingly armed: pubes-

cence of young branches leaves and calyx ochraceo-ferrugineous, pulverulent: leaves rhombic-ovate, shallowly sinuate-angled, 6 to 8 cm. long, 4 to 5.5 cm. broad: inflorescence closely flowered. — Van Heurck & Müll. Arg. in Van Heurck, Obs. 130. — PANAMA, Chagres, Feb., March, 1850 (*A. Fendler*, no. 254).

*S. ochraceo-ferrugineum*. Stems 1.5 to 3 m. high, armed with stout broad-based deltoid prickles: young branches leaves and calyces ochraceo-ferrugineous, densely velutinous-tomentose rarely a little glandular: leaves oblong-ovate, shallowly sinuate-angled or lobed, 7 to 16 cm. long, 4.5 to 12 cm. broad, paler and more tomentose beneath than above: inflorescence loosely many-flowered: calyx in anthesis 8 or 10 mm. long, deeply 5-parted into deltoid-lanceolate acuminate lobes: corolla 3 cm. broad: anthers slender, subequal, 6 or 7 mm. long: berries glabrous, 1 cm. or more in diameter. — *S. obtusifolium*, Benth. Pl. Hartw. 23, not HBK. *S. torvum*, var. *ochraceo-ferrugineum*, Dunal, l. c. 260. — GUANAJUATO, Guanajuato, 1837 (*Hartweg*, no. 204), 1880, 1883 (*A. Dugès*): TAMAULIPAS, San Luis Potosi to Tampico, Dec., 1878 to Feb., 1879 (*Edw. Palmer*, no. 639½); VERA CRUZ, old fields and recently cleared grounds, Wartenburg, near Tantoyuca, 1858 (*Ervendberg*, nos. 285, 485).

*S. DIVERSIFOLIUM*, Schlecht. Sparingly armed: branches petioles and inflorescences cinereous stellate-tomentulose: leaves oblong-ovate, bluntly acuminate, with rounded bases, olive-green and stellate-scabrous above, cinereous-tomentulose or pulverulent beneath, 7 to 20 cm. long, 4 to 12 cm. broad, subentire or slightly undulate, rarely shallowly sinuate: inflorescence subaxillary, simple or branched, becoming 6 to 9 cm. long, extremely floriferous, the pedicels after anthesis mostly strongly reflexed or drooping. — *Linnaea*, xix. 297; Dunal, l. c. 262. — Originally described from Papantla, VERA CRUZ. The following are referred here; Mexico, without locality (*Coulter*, no. 1245): SAN LUIS POTOSI, hills, Las Canoas, Aug. 21, 1891 (*C. G. Pringle*, no. 3901, doubtfully referred here): VERA CRUZ, Valley of Cordova, Dec. 26, 1865 or 1866 (*Bourgeau*, no. 1608); Orizaba (*Botteri*); near Motzorongo, Feb. 22, 1894 (*E. W. Nelson*, no. 149): OAXACA, Paso de Canoa, Tuxtepec, alt. 150 m., Aug. 28, 1895 (*Conzatti*, no. 133, *L. C. Smith* no. 669).

= = Branches unarmed.

*S. Hayesii*. A small tree: the young branches finely but densely invested with short ochraceo-cinereous stellate hairs: upper leaves geminate and unequal, ovate to ovate-oblong, acuminate, unequal and sub-



cordate or rounded at base, entire or slightly undulate, the larger 1.7 to 2.4 dm. long, 1.1 to 1.4 dm. wide, at first stellate-pubescent above, soon quite glabrous and lucid, cinereous-tomentose beneath; primary nerves 5 to 7 pairs; petioles thick, 2 to 4 cm. long: inflorescence extra-axillary, bifid or trifid, becoming 6 or 8 cm. long, the branches scorpoid-racemose, densely flowered, ochraceo-cinereous; pedicels in fruit becoming strongly deflexed: calyx in anthesis 2 mm. long, with short rounded lobes: corolla densely stellate without, 6 or 7 mm. high, barely 1 cm. broad, with long lanceolate lobes: anthers subequal, lanceolate, truncate, 3 or 4 mm. long: style slightly longer, sparingly stellate-pubescent: berry glabrous or sparingly puberulent, 1 cm. or more in diameter. — PANAMA, Chagres, Jan., 1850 (*A. Fendler*, no. 246); near Gatun, Dec., 1859 (*Sutton Hayes*).

\* \* Short stellate pubescence of flowering branches mixed with long slender naked hairs.

*S. erythrotrichum*. Strongly armed with deltoid mostly hooked stout prickles: branches densely reddish-tomentose with appressed stellate hairs and longer naked jointed trichomes: leaves oblong, acuminate, rounded at the base, subentire, 1 to 1.7 dm. long, 3 to 8 cm. wide, ferrugineous-green sparingly stellate and strongly rugose above, tomentulose beneath, at first rufescent, later cinereous, rarely armed on the midrib beneath; primary nerves 5 to 7 pairs; petiole 1.5 to 2.5 cm. long, rufescent; peduncle extra-axillary, 3.5 cm. long, few-flowered, rufescent; pedicels short (7 mm.), thickish: calyx in fruit deeply cut into lanceolate lobes 6 or 7 mm. long: fruit puberulent, becoming glabrate, about 1 cm. in diameter. — GUATEMALA, Coban, Depart. Alta Verapaz, alt. 1,325 m., Feb., 1888 (*H. von Tuerckheim* in exsicc. J. D. Smith no. 1381).

\* \* \* Branches clothed with long stellate-tipped hairs with broad bases.

*S. HISPIDUM*, Pers. Armed with long stout hooked-prickles, and densely pubescent with ochraceous or fuscous distinct stiff trichomes: leaves ovate, subcordate or attenuate at base, 0.5 to 2 dm. long, subentire or with 5 to 11 sinuate lobes; above ferrugineous with distinct stipitate stellate hairs, or glabrate, and often with long sharp prickles on the nerves; beneath cinereous with similar hairs, the nerves often spiny. — Syn. i. 228; Dunal, l. c. 275. *S. stellatum*, Ruiz & Pav. Fl. Per. ii. 40, t. 176. *S. chrysotrichum*, Schlecht. Linnaea, xix. 304; Dunal, l. c. 276. — From the variable material now at hand it seems impossible to

keep *S. chrysotrichum* separate from Persoon's species. VERA CRUZ, Cordoba, alt. 830 m., Aug. 20, 1891 (*H. E. Seaton*, no. 395); Jico, July 16, 1893 (*E. W. Nelson*, no. 24); Orizaba, Jan. 28, 1894 (*E. W. Nelson*, no. 45); OAXACA, Calderon, alt. 1,850 m., San Juan del Estado, June 18, 1894 (*L. C. Smith*, no. 36); near Reyes, alt. 1,785 to 2,060 m., Oct. 24, 1894 (*E. W. Nelson*, no. 1785); CHIAPAS, near Tumbala, alt. 1,230 to 1,690 m., Oct. 20, 1895 (*E. W. Nelson*, no. 3331); GUATEMALA, Santa Rosa, alt. 925 m., June, 1892, San Miguel Uspantán, alt. 1,850 m., Apr., 1892 (*Heyde & Lux* in exsicc. J. D. Smith, nos. 3441, 3448); COSTA RICA, Cartago, alt. 1,650 m., Dec., 1887 (*Juan J. Cooper*, in exsicc. J. D. Smith, no. 5870).

Three species of the subsection *Torvaria*, described from Mexico, are still obscure and perhaps not recently collected. These are *S. amictum*, Moric. in Dunal l. c. 263; *S. rude-pannum*, Dunal, l. c. 264; *S. Lambertii*, Dunal, l. c. 268.

### III.—SOME UNDESCRIBED MEXICAN PHANEROGAMS, CHIEFLY LABIATAE AND SOLANACEAE.

**Pelexia Pringlei.** Roots clustered, cylindric, whitish, tuberiform, 0.5 to 1 dm. long; leaves 3, at the base of the bracteate scape, long-petioled, with smooth entire oblong to ovate-lanceolate acuminate blades 8 to 12 cm. long, about 4 cm. wide; scape about 3 dm. high, sparingly pubescent above, with about 8 sheathing lanceolate bracts: spike 1 dm. long, rather loosely flowered: bracts lance-acuminate, 3 cm. long, much exceeding the ovary: sepals greenish, lanceolate, acuminate, two of them free and somewhat drooping, 2 cm. long, the others united to form a blunt galea; lip short and rounded, exceeded by the beak of the stigma; spur adnate to the ovary: anther ovate, bluntish, 5 m. long. —VERA CRUZ, wooded hills near Jalapa, alt. 1,230 m., April, 1899 (*C. G. Pringle*, no. 8122). Habitally resembling *P. setacea*, Lindl. (*Neottia calcarata*, Hook. Bot. Mag. t. 3403), but with adnate spur, and shorter blunter sepals galea and lip.

**Scutellaria distans.** Stems slender, flexuous, 3 to 4 dm. long, somewhat recurved-pilose on the angles; internodes rather long (3 to 5 cm.): leaves firm, sparingly appressed-pubescent or glabrate, fan-shaped, broader than long, upper from deltoid-ovate to rhombic-ovate,

short-acuminate, coarsely crenate above the rounded or truncate base, 2 to 5 cm. long, 2 to 3.5 cm. wide: flowers solitary in the axils, on slightly pilose pedicels 0.5 cm. long: calyx pilose in lines, in anthesis 4 to 5 mm. long: corolla dark blue, arcuate, 2 to 2.5 cm. long, puberulent without; the lower lip slightly longer than the upper, with a white spot in the middle. — JALISCO, in the Sierra Madre, west of Bolaños, Sept. 15-17, 1897 (*J. N. Rose*, no. 2951). Related to the northern *S. galericulata*, L.

**S. Rosei.** Apparently tall (upper portions of plants at hand 6 to 7 dm. high): stem short cinereous-pubescent: lower leaves suborbicular, rounded at tip, upper ovate, acuminate, coarsely crenate-dentate, rounded or subcordate at base, minutely soft-pubescent on both sides, 4 to 6 cm. long, 3 to 4 cm. wide, on very short pubescent petioles 1 to 3 mm. long: raceme elongated, 2 to 2.5 dm. or more in length: the flowers irregularly scattered, alternate, opposite or fascicled: bracts lanceolate, about equalling the glandular-hirsute pedicels: calyx somewhat glandular-hirsute, in anthesis 3 to 4 mm. long: corolla 2 to 2.5 cm. long, rose-purple above; the pubescent tube pale; the lower lip somewhat exceeding the upper. — SINALOA, foothills of the Sierra Madre, near Colomas, July 20, 1897 (*J. N. Rose*, no. 1784). *Ghiesbreght's* nos. 88 and 803 from CHIAPAS are probably forms of the species, though with smaller corollas.

**S. Pedicularis.** Stems slender, minutely cinereous-puberulent: leaves oblong or ovate-oblong, coarsely crenate-dentate, short-acuminate and blunt at tip, rounded or subtruncate at base, sparsely pubescent above with short appressed hairs, glabrous beneath, 2 to 3.5 cm. long, 1 to 2 cm. wide, on slender finely-puberulent petioles 1.5 to 2 cm. long: raceme 15-25-flowered, at first dense, resembling *Pedicularis canadensis*: bracts linear or lanceolate, equalling the pedicels (3 to 5 mm. long): calyx puberulous, in anthesis 3 to 3.5 mm. long, in fruit becoming 8 to 9 mm. long: corolla yellowish, 2.5 cm. long, the tube barely 2 mm. in diameter nearly to the slightly broader throat; lower lip a little longer than the upper: seeds roughish, not margined. — CHIAPAS, near Tumbala, alt. 1,230 to 1,700 m., Oct. 20, 1895 (*E. W. Nelson*, no. 3342). The specimens are rather fragmentary, so that the base of the plant cannot now be described. Nearly related to the showy *S. Mociniana*, Benth., which has much longer scarlet corollas.

**Stachys (Stachyotypus) flaccida.** Ascending or spreading, freely branched, 4 dm. high or more (?): stems minutely pilose or glabrate; internodes 1 dm. long: leaves thin and flaccid, glabrous or minutely appressed-pubescent beneath, the lower on slender petioles, the upper

becoming sessile, deltoid-ovate to oblong, cordate at base, coarsely crenate, 3 to 7 cm. long: verticels 3-6-flowered, remote, only the lower conspicuously leafy-bracteate: pedicels very short: calyx minutely puberulent, in anthesis 6 mm. long, cleft half way to the base into lance-subulate teeth: corolla apparently pale, 1.1 to 1.3 cm. long; the tube once and a half as long as the calyx; the 3-lobed lower lip twice as long as the entire short pubescent galea. — OAXACA, Hacienda de Caciques, District of Cuicatlan, Aug. 4, 1895, alt. 2,150 m. (*L. C. Smith*, no. 612). Apparently related to *S. Drummondii*, Benth.

*S. (Calostachys) oaxacana*. Stems slender, 2.5 to 6 dm. high, densely retrorse-hispid below, sparingly so or only glandular-puberulent above: leaves deltoid-ovate to deltoid-lanceolate, coarsely crenate, cordate or truncate at base, 1.5 to 3.5 cm. long, above somewhat strigose-pubescent, beneath more or less pubescent, often white with appressed longitudinally spreading stiffish hairs; petioles slender, the lower equalling the blades, the upper shorter: verticels 4-6-flowered, rather remote, only the lowest conspicuously bracteate: pedicels about equalling the calyx: calyx green, glandular-puberulent, in anthesis 5 mm. long, in fruit becoming as broad as long, with 5 deltoid-subulate teeth: corolla scarlet, 2 to 2.5 cm. long, minutely puberulent or glabrate without; the 3-lobed lower lip slightly exceeding the entire or emarginate galea. — OAXACA, near Reyes, alt. 2,060 to 3,080 m., Oct. 20, 1894 (*E. W. Nelson*, no. 1795); Sierra de San Felipe, alt. 2,150 m., Sept. 23, 1895 (*C. Conzatti*, in exsicc. *L. C. Smith*, no. 709); mountains of San Juan del Estado, alt. 2,300 m., Oct. 21, 1895 (*L. C. Smith*, no. 924); Cuicatlan, alt. 1,675 m., Dec. 9, 1895 (*V. González*, no. 47). Closely related to *S. coccinea*, Jacq., with which it has formerly been confused, but from which it is distinguished by its very slender habit, smaller calyx and different pubescence.

*Calamintha oaxacana*. Shrub with smooth brown bark, and very slender minutely puberulent or glabrate branchlets: leaves thin, elliptic-ovate, 1 to 1.5 cm. long, finely and sharply serrate, acute at tip, narrowed or rounded at base; petioles filiform, about equalling the leaf-blades: flowers solitary, axillary, on slender 2-bracteate pedicels 5 to 8 mm. long: calyx tubular, 13-costate, in anthesis 6 to 7 mm. long; the tube twice exceeding the lance-subulate lobes; the upper lip with 3 upturned lobes, the two lobes of the lower straighter: corolla red, 3 to 3.25 cm. long, short-pubescent without. — OAXACA, El Parián-Etla, alt. 1,200 m., Nov. 1898 (*V. González & C. Conzatti*, no. 901). Nearest related to *C. coccinea* of the southern United States. Habit-

ally somewhat resembling *Gardouquia mexicana*, but with the definitely bilabiate lip of *Calamintha*.

*Cunila tomentosa*. Stem tall (probably 8 dm. high), sharply quadrangular, freely paniculate-branched, densely tomentose above and on the younger parts: leaves lanceolate to ovate-lanceolate, acuminate, sessile or short-petioled, entire or sparingly appressed-serrate, above puberulent, beneath densely white-tomentose, 2 to 5 cm. long, 1 to 1.5 cm. wide: racemes dense, spiciform, 1 to 4 cm. long, solitary or in 3's, terminating the short branches: pedicels slender, about equalling the calyx: calyx 2 to 3 mm. long; the tube twice or thrice as long as the lance-subulate teeth, densely villous especially within the throat: corolla villous, slightly exceeding the calyx: stamens mostly included. — OAXACA, between Pluma and San Miguel Suchistepec, alt. 1,850 m., March 21, 1895 (*E. W. Nelson*, no. 2495).

*Hyptis* (*Cephalohyptis*) *madrensis*. Stems procumbent, puberulent (densely short-pilose-hirsute on the younger parts), freely branching; internodes 0.5 to 1 dm. long: leaves thickish, oblanceolate to elliptic-obovate, coarsely crenate-dentate above, the subcuneate entire base narrowed gradually to a short petiole, appressed-pilose on both faces, dark green above, pale beneath, 2.5 to 5 cm. long, 1 to 2 cm. broad: peduncles axillary, 3 to 5 cm. long: fruiting head 2 cm. in diameter: bracts foliaceous, lanceolate to oblong, entire or coarsely dentate, 1 cm. or less long: calyx villous, the long subulate teeth setulose. — TEPIC, foothills of the Sierra Madre, near Pedro Paulo, Aug. 3, 1897 (*J. N. Rose*, no. 1958). Resembling, apparently, *H. Parkeri*, Benth., of South America but differing from that in its pubescent leaves and calyx.

*H. (Minthidium) Pringlei*. Stem 1 m. (?) high, freely branching, more or less pubescent with pilose or somewhat strigose hairs: leaves lanceolate, acute, subsessile or short-petioled, entire, essentially glabrous, 2 cm. or less long: flowers axillary, 2 to 6 in a fascicle: pedicels slender, glabrous, becoming 2 mm. long in fruit: calyx glabrous, campanulate, in anthesis 1.5 mm., in fruit 3 to 4 mm. long, cleft one-third to the base into narrowly deltoid subacuminate lobes: corolla slightly exceeding the calyx. — SAN LUIS POTOSI, Tamasopo Cañon, Aug. 5, 1890 (*C. G. Pringle*, no. 3223). Related to *H. verticillaris*, with which it has been confused, but with axillary flowers.

*H. (Minthidium) axillaris*. Similar to the preceding: leaves lanceolate or rhombic-lanceolate, 7 cm. or less in length, acuminate, coarsely and irregularly serrate above the middle, entire below and cuneate to petioles 1 cm. or less long, puberulent above, pilose beneath on the



nerves: calyx sparingly pubescent or glabrate, salverform, with shorter broader lobes. — PUEBLA, near Metlatoyuca, alt. 250 m., Jan. 31, 1898 (*E. A. Goldman*, no. 48).

*H. (Hypenia § Laxiflorae) Nelsonii*. Tall, stem smooth and glossy below, minutely puberulent above: leaves thick, glabrous, rather glaucous, lance-acuminate, slightly auriculate-clasping at base, those of the stem 1.5 to 2 dm. long, with fine short teeth along the margin, the upper much shorter and entire: panicle 4 to 5 dm. long, dichotomous; the lower ascending branches 3 dm. long: bracts ovate-lanceolate, acuminate, puberulent, 1 cm. or less long: ultimate pedicels 0.5 to 1 cm. long: calyx puberulent, campanulate, in anthesis 5 to 6 mm., in fruit 1 cm. long, strongly 13-nerved, slightly bilabiate; the deltoid acuminate lobes one-half as long as the tube: corolla 2 to 2.25 cm. long; the tube constricted below, tubular and slightly enlarged upward; the blunt lobes only 3 or 4 mm. long: styles and anthers exserted, glabrous: nutlets oblong-obovate. — JALISCO, between San Sebastian and the summit of Mt. Bufa de Mascota, alt. 1,850 m., March 20, 1897 (*E. W. Nelson*, no. 4108). A unique plant among the Mexican species, belonging to a section hitherto known only from Brazil and adjacent South America.

*Lycium geniculatum*. Branches slender, geniculate, covered with pale gray bark; spines slender, on the flowering branches about 8 mm. long, barely 1 cm. apart: leaves very glaucous, glabrous, oblong to obovate, blunt or acute, 2.5 cm. long or less, on slender petioles 1 cm. or less in length: flowers abundant in small cymes, terminating the rather crowded short ultimate branchlets: pedicels 7 to 9 mm. long: calyx glabrous, short campanulate, 2 mm. high, slightly broader, with 5 spreading lance-subulate teeth 1 to 1.5 mm. long: corolla 1.2 cm. long, funnel-form, with broad-cordate lobes 4 to 5 mm. long, pubescent within the tube: stamens slightly unequal, a little exserted; filaments pubescent below: fruit 5 to 8 mm. in diameter, red with a bloom. — PUEBLA, near Tehuacan, Nov. 27, 1895 (*C. G. Pringle*, no. 7000). Nearest related, apparently, to *L. cestroides*, Schl., of Brazil.

*Margaranthus sulphureus*. Annual, glabrous; stem stout and rather fleshy, 4 dm. high, branching above: lower leaves alternate, the upper and those of the branches geminate and unequal, from ovate to broadly rhombic-obovate, subentire or shallowly and bluntly sinuate, the larger 3 to 6 cm. long, 3 or 4 cm. wide, narrowed below to winged petioles varying from 1 to 4 cm. long; upper leaves smaller, sometimes sessile: flowers generally single from each of the upper axils; pe-



duncle slender, somewhat arcuate, in fruit becoming 0.5 to 1.5 cm. long: calyx in anthesis 3 or 4 mm. long, sparingly pilose, with 5 short deltoid ciliate lobes: corolla campanulate-urceolate, 7 to 10 cm. long, nearly as broad, sulphur-yellow, with purple patches at base: fruiting calyx glabrate, globose, 1 to 1.5 cm. in diameter, the short calyx-tips closely connivent. — MEXICO, borders of ditches, Valley of Mexico, July 10, 1865 or 1866 (*Bourgeau*, no. 111), Valley of Mexico, alt. 2,250 m., Oct. 4, 1899 (*C. G. Pringle*, no. 8215). A much coarser plant than the similar *M. solanaceus*, with larger yellower corolla.

*Athenaea Nelsonii*. Stems petioles and pedicels glandular-villous, fuscous: leaves solitary or geminate and very unequal, on petioles 8 cm. or less in length, broadly ovate, acuminate, equally or unequally cordate at base, entire, undulate or slightly sinuate-toothed, the larger 2 dm. long, thin, dark green and minutely pubescent above, pale and appressed-pilose beneath, especially on the nerves: flowers in fascicles of 5 to 15: pedicels at first rather short, in fruit becoming 2 to 3 cm. long: calyx thin, glandular-pilose, short-campanulate, in anthesis 5 to 6 mm. high and broad, rounded or subtruncate at base, the tube hardly equalling the 5 deltoid lobes: corolla yellowish, 1.5 to 2 cm. long, deeply cut into oblong ciliate lobes 1 cm. long: filaments broad at base, inserted midway up the throat of the corolla, rather shorter than the oblong anthers (3.5 to 4 mm. long): fruiting calyx becoming 1 cm. in diameter, inclosing the scarlet berry. — CHIAPAS, between Tumbala and El Salto, alt. 460 to 1,385 m., Oct. 29, 1895 (*E. W. Nelson*, no. 3395). A large-leaved species habitually resembling *A. viscosa*, Benth. & Hook. (*Saracha viscosa*, Schrad., Sweet, Brit. Fl. Gard. ser. 2, t. 323), but with smaller more regular calyx, more deeply lobed corolla and much shorter filaments.

*Physalis subintegra*. Perennial from a very slender root-stock 3 or 4 dm. long, ascending, slightly branching from near the base: stems tough, dark green, sparingly appressed-pubescent with simple hairs or glabrate, about 3 dm. high: leaves from ovate-lanceolate to broadly ovate, 3 to 6 cm. long, 1.5 to 3 cm. broad, entire or slightly repand-dentate, somewhat appressed-pubescent on both surfaces, tapering above to a blunt tip and slightly rounded below to a petiole 0.5 to 2 cm. long: peduncle short, 0.5 to 1 cm. long: calyx in anthesis 7 to 10 mm. long, pubescent, with triangular-lanceolate or ovate acute lobes: corollas pubescent without, the earlier 2.5 cm. broad, the later smaller, sulphur yellow with large dull brown markings at base: one filament slightly exceeding the others, 5 mm. long: anthers oblong, purplish, 2 or 3 mm. long: fruiting calyx globose-ovoid, a little sunken at base, slightly 5-angled, firm and

strongly veiny, 3 to 3.5 cm. long. — MEXICO, Sierra de las Cruces, alt. 3,080 m., Sept. 19, 1899 (*C. G. Pringle*, no. 8225); VERA CRUZ, Orizaba (*Botteri*, no. 207): OAXACA, slopes of Mt. Zempoaltepec, alt. 2,400. to 3,080 m., July 5-10, 1894 (*E. W. Nelson*, nos. 587, 681): JALISCO, between Huejuilla and Monte Escobedo, Aug. 25, 26, 1897 (*J. N. Rose*, nos. 2577, 2606). Nearly related to *P. arenicola*, Kearney, of the southeastern United States.

*P. philippensis*. Freely branching from a stout woody caudex; the slender branches somewhat ligneous at base, about 2 dm. in length, long-pilose with crisp white jointed hairs: leaves appressed-pubescent above, pilose beneath on the veins and ciliate on the margins, broadly rhombic-ovate, coarsely and bluntly angulate-sinuate, 1 to 3 cm. long, 1 to 2.5 cm. wide, broadly subcuneate below to a broad long-pilose petiole 1 to 1.5 cm. long: peduncles 1 cm. long, pilose: calyx during anthesis about 8 mm. long, white-pilose, cleft into narrowly ovate acutish or blunt lobes: corolla short-campanulate, 1.5 cm. long, 2 to 2.5 cm. broad, whitish or pale yellow, with very broad purplish markings: 2 filaments longer than the others, 7 mm. long; anthers short-oblong, purple and yellow, 3 or 4 mm. long: fruit not seen. — OAXACA, Sierra de San Felipe, alt. 2,617 m., June 1, 1894 (*C. G. Pringle*, no. 5621).

*P. sordida*. Perennial, densely pubescent all over with short sordid glandular-pilose hairs: the stems depressed, 4 or 5 dm. long, freely branching: leaves from suborbicular to ovate, coarsely but bluntly sinuate-dentate, subcordate or truncate below, pubescent on both faces, 1 to 5 cm. long, 1 to 3 cm. broad, on slender glandular-pilose petioles 1 to 3 cm. long: peduncles short, barely 1 cm. long in fruit: calyx in anthesis 6 or 7 mm. long, sordid-pubescent, with triangular-lanceolate acute lobes: earlier corollas 1.5 cm. broad, sulphur-yellow, with small drab or brownish patches at base: filaments somewhat unequal; anthers yellow and green, narrowly oblong, 3 or 4 mm. long: fruiting calyx broadly short-ovate, glandular-pilose, not conspicuously angled, 1.5 to 2 cm. long. — Apparently in sand (the entire plant coated with fine sand), OAXACA, Boca de Leon, Telixtlahuaca, alt. 2,310 m., Aug. 8, 1895 (*Albert L. Smith*, no. 637). Nearest related, apparently, to *P. rotundata*, Rydberg, of the southwestern United States.

*P. saltillensis*. Puberulent throughout with fine white stellate hairs: branches slender, terete below, sub-angulate above: leaves elliptic-ovate, coarsely and bluntly sinuate-dentate, the upper unequal and geminate, 3 to 6 cm. long, 2 to 4 cm. wide, unequally subcuneate or rounded at base

to a slender petiole 1.5 to 3.5 cm. long: peduncle filiform, usually curved at tip, in fruit 2 to 3.5 cm. long: calyx in anthesis 6 mm. long, with short narrowly triangular acutish or blunt lobes: corolla 1 to 1.5 cm. broad, sulphur-yellow, with purple patches at base: fruiting calyx ovate, 1.5 to 2 cm. long, obscurely 5-angled, the tips connivent: mature berry orange, edible. — COAHUILA, in shade, Saltillo, Sept. 1898 (*Edw. Palmer*, no. 332).

**P. Rydbergii.** Perennial (?): stem slender, tough, much branched, finely glandular-puberulent: leaves lanceolate to ovate-lanceolate, subentire or shallowly sinuate-dentate, finely glandular-pubescent on both faces, 0.5 to 1.5 cm. long, 3 to 5 mm. broad, acute at tip, tapering unequally at base to slender petioles about half as long: peduncle filiform, in fruit becoming 1 to 1.5 cm. long: calyx open-campanulate, the lobes not connivent at tip, in anthesis 0.5 cm. long, with ovate-lanceolate blunt lobes: corolla barely 1 cm. in diameter, yellow, with 5 acute lobes: fruiting calyx broadly open-campanulate, 1 cm. long, 5-10-angled, strongly reticulate. — MEXICO, Ymala, Sept. 25-Oct. 8, 1891 (*Edw. Palmer*, no. 1713). Dedicated to Per Axel Rydberg, whose critical studies of this genus have greatly cleared the confusion which prevailed in the American species, and to whose unique section *Crassifoliae* the present species is an addition.

**Solanum (Anthoresis) plumense.** Shrub with cinereous smoothish bark: young branches finely pulverulent: leaves ovate-lanceolate, long-acuminate, acutish or rounded at the base, 1 to 1.8 dm. long, 4 to 6 cm. wide, entire or slightly undulate, minutely cinereous-stellate on both faces; petioles slender, 2 to 5 cm. long: corymb on a long cinereous-pulverulent peduncle, in fruit 1 to 1.5 dm. broad, many-flowered: calyx 2 mm. high, cinereous-stellate, with 5 ovate-deltoid bluntish lobes: corolla white, stellate-pulverulent without, 0.5 cm. high, 1.5 cm. broad, with ovate-lanceolate lobes: stamens subequal, oblong, truncate, 2 to 2.5 mm. long: fruit subglobose, sparingly pulverulent, 1 cm. in diameter. — OAXACA, about Pluma, alt. 925 to 1,480 m., March 17, 1895 (*E. W. Nelson*, no. 2493).

**S. (Polymeris) dejectum.** Branching a little above the stout woody root: stems slender, herbaceous, ascending, decumbent at base, branching, cinereous-pilose above with fine stellate hairs: upper leaves geminate, unequal, from subreniform to broadly ovate, rounded or tapering to a bluntish tip, subtruncate or gradually tapering below to a petiole 1 to 3.5 cm. long, finely and closely cinereous-stellate on both faces, more strongly so beneath, entire or slightly undulate, 2 to 5 cm. long:

peduncles slender, in anthesis erect, 0.5 to 1 dm. long, soon strongly dejected: calyx white-stellate, with 10 long linear-subulate divisions: corolla 3 to 4 cm. broad, plicate, 5-angled, violet or violet and white: filaments short, one of them twice or thrice exceeding the others, 5 mm. long; anthers broad-lanceolate, blunt, 5 mm. long: style 10 to 12 mm. long, glabrous: fruit said to be yellow. — DURANGO, rare in crevices of rocks, Iron Mt., &c., near Durango, July, 1896 (*Edw. Palmer*, no. 347): MEXICO, Mount Zacoalco, July 10, 1865 or 1866 (*Hahn*, no. 543); San Juan del Rio, July 14, 1896 (*C. G. Pringle*, no. 7202): GUANAJUATO, in fields, 1895 (*A. Dugès*). Related, apparently, to *S. somniculentum*, Kunze, but differing in its closer whitish pubescence, longer petioles, longer more slender peduncles, and generally blunter leaves.

*S. (Polymeris) nocturnum*. A woody climber with the habit of *S. lentum*, Cav.: branches glabrous, or minutely stellate-puberulent at tips: leaves solitary or geminate, ovate, 2.5 to 5 cm. long, 2 to 3 cm. wide, with acute or obtuse tips, rounded or acutish below to slender petioles 1 cm. or less in length, subentire, glabrous on both faces, or sparingly puberulent when young: peduncles solitary or in 2's, 1 to 2 cm. long, bearing solitary nocturnal blue flowers: calyx, in anthesis sparingly puberulent, later quite glabrate, a shallow cup with 10 lance-subulate teeth; corolla minutely and sparingly puberulent without, 12 mm. high: berry apparently red, glabrous, 1 cm. in diameter. — GUERRERO, low sandy soil, Acapulco, Jan., 1895 (*Edw. Palmer*, no. 533): OAXACA, river-bed above Tehuantepec, Jan. 10, 1896 (*Ed. Seler*, no. 1625).

*S. (Cryptocarpum) macrosolum*. Plant with the habit of *S. rostratum*, Dunal: stem puberulent, slightly glandular above, armed with rather scattered yellowish straight stout spines 1 to 1.75 cm. long: leaves very deeply pinnatifid, the segments again cut into rounded lobes, sparingly pilose above or glabrate, armed with long stout spines: calyx hirsute, becoming glabrate, armed with several long (1.5 cm.) slender spines and many shorter finer ones, deeply cut into lanceolate lobes: corolla as in *S. rostratum*: 4 stamens subequal, 8 or 10 mm. long, the other larger, arcuate, 18 mm. long: fruiting calyx, including the persistent lobes, 15 to 18 mm. long. — OAXACA, near the town of Oaxaca, Sept. 19, 1895 (*L. C. Smith*, no. 814), Nov. 18, 1895 (*Ed. Seler*, no. 1394): originally collected by Haenke, presumably between Acapulco and the City of Mexico.

*S. (Nycterium) azureum*. Stem fruticose, the young branches, with peduncles pedicels and calyx, cinereous with dense but fine stellate pubescence; the branches sparingly beset with remote straight slender

brown spines 7 mm. or less in length: leaves solitary or the upper geminate, thin, elliptic-ovate, 4 to 9 cm. long, 2 to 3.5 cm. broad, deeply sinuate-pinnatifid into 5 or 7 unequal oblong or obovate entire or undulate obtuse lobes; above green and thinly pubescent with appressed-stellate hairs, beneath slightly more pubescent, especially on the prominent sometimes sparingly short-setulose nerves; petioles slender, 1 to 3.5 cm. long, often sparingly setulose: peduncles lateral, 5-10-flowered, becoming 6 or 7 cm. long: calyx campanulate, in the staminate flower unarmed, in the pistillate with slender spines 5 mm. or less in length, the 5 lance-subulate teeth 8 or 9 mm. long: corolla 4 or 5 cm. broad, plicate, stellate-tomentose without, apparently sky-blue, slightly irregular, deeply cut into 5 ovate-lanceolate curved segments: anthers yellow, subsessile, in the staminate flower the two shorter ones 1 to 1.5 cm. long, the three longer 3 to 3.5 cm. long, strongly curved above; in the hermaphrodite flower the two short anthers scarcely 1 cm. long, the three long ones straight, 1.5 cm. long: style 2.5 cm. long, strongly curved above: fruit globose, 1.25 cm. in diameter, in herbarium specimens olive-brown; the fruiting-calyx deeply cleft, excluding the fragile elongated lance-subulate tips, about half the height of the fruit. — **SINALOA**, Topalobampo, Sept. 15-25, 1897 (*Edw. Palmer*, no. 178). Related to the common *Solanum amazonium*, Ker, and to *S. obtusifolium*, Mart. & Gal. From *S. amazonium* it differs principally in its thin deeper-lobed and greener leaves, its longer stamens and shorter fruiting-calyx. From of *S. obtusifolium* as described it is separated by its larger leaves which are not "cordate-ovate," and its much larger flowers.

**Datura villosa.** Annual, 1.5 to 3 dm. high: young branches and petioles villous with long white hairs: leaves 0.5 to 1 dm. long, petiolate, ovate, sinuate-angulate or deeply cut, villous above and especially beneath on the veins, becoming glabrate: calyx cylindric, 2.5 to 3.5 cm. long, somewhat villous, with 5 short teeth: corolla narrow, twice exceeding the calyx, pale below, purplish at edge, with 5 short lance-subulate teeth: capsule puberulent, about 5 cm. across, armed with comparatively few coarse and unequal flat prickles. — **JALISCO**, Bolaños, Sept. 10-19, 1897 (*J. N. Rose*, no. 3680): **SAN LUIS POTOSI**, in sand near the city of San Luis Potosi, 1876 (*J. G. Schaffner*, no. 706); in the mountains at 1,850 to 2,450 m., 1878 (*Parry & Palmer*, no. 658, in part). — Related to *D. quercifolia*, HBK., with which it has been confused.

**CESTRUM ELEGANS**, Schlecht., var. *truncata*. Like the species as



represented in Bot. Reg. xxx. t. 43, but with the corolla limb merely short-toothed or subentire, not definitely lobed. — VERA CRUZ, San Miguel del Soldado, alt. 1,850 m., April 20, 1899 (*C. G. Pringle*, no. 7800).

*C. fulvescens*. Branches stout; cortex yellowish brown, pruinose or glabrate: leaves lanceolate or ovate-lanceolate, short-acuminate, 4 to 7 cm. long, 1 to 2 cm. wide, on slender petioles 1 to 2 cm. long, dark green and minutely puberulent above, yellow-green and puberulent beneath: inflorescences on short (1 dm. or less) leafy fulvous-pubescent branches; the flowers in small axillary clusters or more abundant at the naked tip; pedicels 3 to 7 mm. long, jointed below the very slender neck (3 mm. long) of the calyx: tubular-campanulate calyx broadened above, 1.5 to 2 cm. long, glabrous, conspicuously nerved, with 5 (or 6) unequal deltoid acute ciliate lobes 4 mm. or less in length: corolla 2.5 to 3 cm. long, the yellow tube slender, slightly exceeding the calyx, clavate above and enlarged at the throat; limb of 5 (or 6) elongate-lanceolate strongly involute ascending yellow-brown lobes, short-pubescent especially within. — OAXACA, mountains of Telixtlahuaca, alt. 2,000 m., Apr. 5, 1895 (*L. C. Smith*, no. 343). Apparently a member of the section *Habrothamnus*, but with paler flowers than in any described species of that section.

*C. Bourgeauianum*. Branches slender, glabrous, covered with a grayish brown cortex: leaves glabrous, entire, oblong-lanceolate to oblong-elliptic, acutish, including the short petiole 4 to 6 cm. long, 1 to 2.5 cm. wide: inflorescence leafy-paniculate, of mostly compound sparingly bracteate flexuous or drooping long-peduncled racemes 4 to 9 cm. long: pedicels slender, 3 to 9 mm. long, gradually thickened to the glabrous campanulate shallowly 5-cleft calyx (in anthesis 4 to 5 mm. long, 2 to 3 mm. broad): corolla yellow, glabrous throughout, 1.7 to 2 cm. long, narrowly funnelform below, gradually broadened at the throat; limb with 5 generally broad-flaring somewhat rounded lobes nearly 0.5 cm. long: mature fruit nearly 1 cm. in diameter; calyx becoming as broad as long. — MEXICO, Valley of Mexico, June 12, 1865 or 1866 (*Bourgeau*, no. 57): OAXACA, Mts. southeast of Miahuatlan, alt. 2,950 to 3,235 m., 1895 (*E. W. Nelson*, no. 2525). This is perhaps *C. pedunculare*, Pavon, but that species is described as having glandular reddish branches, purplish-veined leaves, and acuminate corolla-lobes.

*Aster jalapensis*. Perennial from slender elongated rootstocks: stems decumbent at base, 1 to 2.5 dm. high, slender, very leafy, pilose in lines: leaves oblanceolate, bluntly and shortly acuminate, glabrous or



minutely puberulent, the upper half coarsely appressed-serrate, the lower half entire and cuneate to a narrow-winged subpetiolar strongly ciliate base, including the subpetiolar portion 3 to 5 cm. long, 0.5 to 1 cm. wide; the upper smaller: peduncles slender, bracteate, elongate, 2 to 6 cm. long, bearing 1 or 2 heads about 1 cm. broad: bracts of involucre 3-seriate, linear-oblong, the inner 6 mm. long, the outer much shorter, slightly ciliate on the margins, with short bluntish herbaceous appressed tips: rays white: achene pubescent. — VERA CRUZ, wet ledges, Barranca de Chavarrillo, alt. 920 m., Apr. 24, 1899 (*C. G. Pringle*, no. 8118). Somewhat resembling *A. bullatus*, Klatt, but a lower more slender plant with shorter broader leaves, broader involucre bracts, and more slender peduncles.

***Encelia Pringlei*.** Stem subterete, scabrous-puberulent: leaves oblong or ovate-lanceolate, acuminate, the lower rather abruptly narrowed below the middle into an oblong portion which is somewhat auriculate at base; the larger 1.2 to 1.4 dm. long, 4 to 6 cm. wide, above tuberculate-scabrous; beneath scabrous, glandular-dotted, and somewhat villous on the nerves; petioles very short: inflorescence terminal, corymbose, 1 to 1.5 dm. across: heads 1 to 1.5 cm. broad, excluding the rays 1.5 cm. long: bracts of involucre 2-3-seriate, the outer successively shorter, linear-oblong, bluntish, appressed-pubescent and somewhat glutinous: rays 8 or 9, ovate-oblong, 1 cm. long, orange-yellow: achene 6 mm. long, silvery-silky; the pappus of two lanceolate awn-tipped pales 4 or 5 mm. long, and two shorter broader somewhat lacerate ones. — HIDALGO, hill-sides above Pachuca, alt. 2,770 m., Sept. 14, 1899 (*C. G. Pringle*, no. 8248). With remarkably paleaceous pappus for an *Encelia*, but apparently very closely related to *E. glutinosa*, Rob. & Greenman.